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REPORT AND TRANSACTIONS
OF THE
DEVONSHIRE ASSOCIATION

FOR
THE ADVANCEMENT OF SCIENCE, LITERATURE,
AND ART.

[TOTNES, JULY, 1880.]

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The Editor is requested by the Council to make it known to the Public, that the Committees and Authors alone are responsible for the facts and opinions contained in their respective Reports and Papers.

It is hoped that Members will be so good as to send to the Editor, the Rev. W. HARPLEY, Clayhanger Rectory, Tiverton, not later than 16th January, 1881, a list of any *errata* they may have detected in the present volume.

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1880-81.

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TABLE SHOWING THE PLACES AND TIMES OF MEETING OF THE DEVONSHIRE ASSOCIATION,

With the Officers, Number of Members, and Number of Papers read, from its commencement.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
EXETER— August 14th, 1862. 69 Members 5 Papers	Sir John Bowring, LL.D., F.R.S.	The Mayor of Exeter (W. Kendall, Esq.) Sir L. Falk, Bart., M.P. A. H. A. Hamilton, Esq. T. Shapter, Esq., M.D.	W. Vicary, Esq., F.G.S.	C. Spence Bate, Esq., F.R.S. Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S.
PLYMOUTH— July 29th, 30th, 1863. 80 Members 10 Papers	C. Spence Bate, Esq., F.R.S., F.L.S.	Sir John Bowring, LL.D., F.R.S. The Mayor of Plymouth (W. Derry, Esq.) Sir W. Snow Harris, F.R.S. J. L. Colley, Esq.	W. Vicary, Esq., F.G.S. J. Dobb, Esq.	Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S. J. B. Rowe, Esq., F.L.S.
TORQUAY— July 20th, 21st, 1864. 92 Members 15 Papers	E. Vivian, Esq., M.A.	C. Spence Bate, Esq., F.R.S., F.L.S. Chairman Torquay Local Board of Health (A. B. Sheppard, Esq.) Rev. R. H. Barnes, M.A. W. Pengelly, Esq., F.R.S., F.G.S.	W. Vicary, Esq., F.G.S.	Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S. E. Appleton, Esq.
TIPTON— June 28th, 29th, 1865. 99 Members 14 Papers	C. G. B. Daubeny, M.D., LL.D., F.R.S., Professor of Botany, Oxford.	E. Vivian, Esq., M.A. The Mayor of Tiverton (W. N. Row, Esq.) C. A. W. Troyte, Esq.	E. Vivian, Esq., M.A. J. G. Dickenson, Esq.	Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S. Rev. J. B. Hughes, M.A.
TAVISTOCK— August 8th, 9th, 1866. 132 Members 18 Papers	The Earl Russell, K.G., K.G.C., F.R.S., &c.	C. G. B. Daubeny, M.D., LL.D., F.R.S., &c. His Highness Rajah Brooke Sir J. Trelawny, Bart. J. Carpenter-Garnier, Esq. A. Russell, Esq., M.P. J. D. A. Samuda, Esq., M.P.	E. Vivian, Esq., M.A. E. Straker, Esq.	Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S. Rev. D. Griffith.
BARNSTAPLE— July 23rd to 26th, 1867. 146 Members 26 Papers	W. Pengelly, Esq., F.R.S., F.G.S.	The Earl Russell, K.G., K.G.C., F.R.S. The Mayor of Barnstaple (R. Farleigh, Esq.) The Earl Fortescue J. B. Chaucker, Esq. J. Jerwood, Esq., M.A., F.G.S.	E. Vivian, Esq., M.A. T. W. M. W. Guppy, Esq.	Rev. W. Harpley, M.A. H. S. Ellis, Esq., F.R.A.S. R. W. Cotton, Esq.

HONORARY— July 28th to 30th, 1868. 178 Members 23 Papers	J. D. Coleridge, Esq., <i>q.c.</i> , <i>M.A., M.P.</i>	W. Pengelly, Esq., <i>F.R.S., F.G.S.</i> The Mayor of Houlton (D. Gould, Esq.) Right Hon. Sir J. T. Coleridge Sir J. Kennaway, Bart. W. R. Bayley, Esq. A. B. Cochrane, Esq., <i>M.P.</i> J. Goldsmid, Esq., <i>M.P.</i> G. Gordon, Esq. G. Neumann, Esq. Rev. Preb. Mackinnon, <i>M.A.</i> W. Porter, Esq.	E. Vivian, Esq., <i>M.A.</i> <i>E. Welkey, Esq.</i>	Rev. W. Harpley, M.A. <i>Rev. R. Kewen, M.A.</i> <i>Rev. H. E. Venn, M.A.</i>
DARTMOUTH— July 20th to 22nd, 1869. 246 Members 23 Papers	G. P. Bidder, Esq., <i>c.b.</i>	Sir J. D. Coleridge, q.c., <i>M.A., M.P.</i> Sir H. P. Seale, Bart. W. Froude, Esq., <i>M.A.</i> C. S. Hayne, Esq. G. F. Luttrell, Esq. A. Ridgway, Esq. Rev. J. Tracey, <i>M.A.</i>	E. Vivian, Esq., <i>M.A.</i> <i>F. Ash, Esq.</i>	Rev. W. Harpley, M.A. <i>P. Hocking, Esq.</i>
DEVONPORT— July 20th to 22nd, 1870. 276 Members 23 Papers	J. A. Froude, Esq., <i>M.A.</i>	G. P. Bidder, Esq., <i>c.b.</i> The Mayor of Devonport (J. Rolston, Esq., <i>M.D.</i>) Vice-Adml. the Hon. J. R. Drummond, <i>c.b.</i> Rear-Admiral Stewart, <i>c.b.</i> G. Dansey, <i>M.D.</i> J. D. Lewis, Esq., <i>M.P.</i> J. May, Esq. A. Moore, Esq. I. C. Radford, Esq. J. W. W. Ryder, Esq. E. St. Aubyn, Esq. P. W. Swain, Esq. T. Woolcombe, Esq.	E. Vivian, Esq., <i>M.A.</i> <i>Rev. E. Roberts, M.A.</i>	Rev. W. Harpley, M.A. <i>G. T. Rolston, Esq.</i>

* Italics indicate Local officers.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
<p>BIDEFORD— Aug. 16th to 17th, 1871. 283 Members 28 Papers</p>	<p>Rev. Canon C. Kingsley, M.A., F.L.S., F.G.S.</p>	<p>J. A. Froude, Esq., M.A. The Mayor of Bideford (J. How, Esq.) Rev. F. L. Baseley J. R. Pine Coffin, Esq. Captain E. P. Charlewood, R.N. W. A. Deane, Esq. Rev. I. H. Gosset, M.A. General Sir E. Green Captain Molesworth, R.N. E. U. Vidal, Esq. N. Whitley, Esq. Captain Willett A. B. Wren, Esq.</p>	<p>E. Vivian, Esq., M.A. R. Simpkins, Esq.</p>	<p>Rev. W. Harpley, M.A. J. A. Perry, Esq.</p>
<p>EXETER— July 30 to Aug. 1, 1872. 294 Members 33 Papers</p>	<p>The Right Rev. Lord Bishop of Exeter</p>	<p>Rev. Canon C. Kingsley, M.A., F.L.S., F.G.S. The Mayor of Exeter (J. Harding, Esq.) The Sheriff (Horace G. Lloyd, Esq.) Sir L. Falk, Bart, M.P. Sir John Bowring, LL.D., F.R.S. Sir J. D. Coleridge, Q.C., M.A., M.P. E. A. Bowring, Esq., M.P. Rev. Presentor Cook, M.A. H. S. Ellis, Esq., F.R.S. Rev. Treasurer Hawker, M.A. J. Kennaway, Esq., M.P. E. Parfitt, Esq.</p>	<p>E. Vivian, Esq., M.A. W. Cotton, Esq.</p>	<p>Rev. W. Harpley, M.A. Rev. E. Kivuan, M.A., F.S.A. G. W. Ormerod, Esq., M.A., F.G.S. E. Parfitt, Esq.</p>

<p>STDMOUTH— July 22nd to 24th, 1873. 330 Members 26 Papers</p>	<p>The Right Hon. S. Cave, M.A., M.P.</p>	<p>The Right Rev. Lord Bishop of Exeter The Right Hon. and Rev. The Earl of Buckinghamshire The Hon. and Rev. the Lord Sidney Godolphin Osborne Sir J. Floyd, Bart. Sir J. H. Kennaway, Bart., M.P. Rev. H. G. J. Clements, M.A. W. R. Coleridge, Esq. C. J. Cornish, Esq. P. O. Hutchinson, Esq. J. Ingleby Mackenzie, Esq., M.B. W. Radford, M.D. R. N. Thornton, Esq.</p>	<p>E. Vivian, Esq., M.A. <i>Captain Roe, R.N.</i></p>	<p>Rev. W. Harpley, M.A. <i>J. Ingleby Mackenzie, Esq.,</i> M.B.</p>
<p>TRIGENMOUTH— July 28th to 30th, 1874. 327 Members 33 Papers</p>	<p>The Right Hon. the Earl of Devon</p>	<p>The Right Hon. S. Cave, M.A., M.P. J. G. Beavan, Esq. The Right Hon. Lord Clifford R. M. Dunn, Esq. E. Gulson, Esq. Rev. Treasurer Hawker, M.A. Rev. W. Laidley, M.A. W. C. Lake, Esq., M.D. J. A. Magrath, Esq., M.D. G. W. Ormerod, Esq., M.A., F.G.S. J. Parson, Esq. T. V. Wollaston, Esq., M.A., F.L.L. H. B. T. Wrey, Esq.</p>	<p>E. Vivian, Esq., M.A. <i>J. Whitborne, Esq.</i></p>	<p>Rev. W. Harpley, M.A. <i>G. W. Ormerod, Esq., M.A.,</i> F.G.S.</p>

* Italics indicate Local officers.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
<p>TORRINGTON— July 27th to 29th, 1876. 366 Members 29 Papers</p>	R. J. King, Esq., M.A.	<p>The Right Hon. The Earl of Devon The Mayor of Torrington (T. Jackson, Esq.) Rev. S. Buckland, M.A. W. Cann, Esq. The Right Hon. Lord Clinton Rev. F. T. Colby, B.D., F.S.A. W. A. Deane, Esq. W. H. Gamlan, Esq. H. S. Gill, Esq. J. G. Johnson, Esq., M.P. W. H. Halliday, Esq., M.A. Dr. A. Kingdon Rev. C. E. Palmer, M.A. W. E. Price, Esq. Hon. Mark Rolle J. C. Moore-Stevens, Esq. R. L. Tapley, Esq.</p>	E. Vivian, Esq., M.A. <i>M. R. Loveland, Esq.</i>	Rev. W. Harpley, M.A. <i>Geo. Dox, Esq.</i>
<p>ASHBURTON— July 26th to 27th, 1876. 400 Members 33 Papers</p>	Rev. Treasurer Hawker, M.A.	<p>R. J. King, Esq., M.A. The Portreeve of Ashburton (P. F. S. Amery, Esq.) Baldwin J. P. Bastard, Esq. A. Champernowne, Esq., M.A., F.G.S. R. Dymond, Esq., F.S.A. F. H. Firth, Esq. C. J. Fellett, Esq. Rev. P. Jackson, M.A. R. Jardine, Esq. J. B. Paige-Browne, Esq., M.A. J. Robinson, Esq. Rev. W. H. Thornton, B.A. J. Tozer, Esq. R. Tucker, Esq. J. Wootley, Esq. Rev. C. Worthy, M.A.</p>	E. Vivian, Esq., M.A. <i>W. S. Gerrard, Esq., M.D., F.G.S.</i>	Rev. W. Harpley, M.A. <i>J. S. Amery, Esq.</i>

* Italics indicate Local officers.

KINGSTON—
 July 31st to Aug. 2nd,
 1877.
 504 Members
 33 Papers

Ven. Archdeacon Earle, M.A.

Rev. Treasurer Hawker, M.A.
 G. P. Bidder, Esq., C.E.
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 W. Cubitt, Esq.
 F. S. Cornish, Esq.
 J. Elliot, Esq.
 Rev. A. N. Hingsdon, M.A.
 Robert Hurrell, Esq.
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 Rev. J. Sloane-Evans, M.A.

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J. S. Hurrell, Esq.

E. Vivian, Esq., M.A.
B. Balkwill, Esq.

PAIGINTON—
 July 30th to Aug. 1st,
 1878.
 471 Members
 34 Papers

Sir Samuel White Baker,
M.A., F.R.S., F.R.G.S.

Ven. Archdeacon Earle, M.A.
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R. S. S. Carey, Esq., J.P.
A. H. Dendy, Esq., M.A.
J. T. Goodridge, Esq., M.R.C.S.
Rev. Preb. Hall, M.A.
R. Mallock, Esq.
C. H. Pridham, Esq., F.R.C.S.
F. H. Spragge, Esq., J.P.
Rev. T. B. R. Stebbing, M.A.
Captain Syngde, R.N.
F. H. Trevithick, Esq.

Rev. W. Harpley, M.A.
W. Edward Tucker, Esq.

E. Vivian, Esq., M.A.
A. Gregory, Esq.

* Italics indicate Local officers.

TABLE SHOWING THE PLACES AND TIMES OF MEETING, ETC.—Continued.

PLACES, TIMES, &c.	PRESIDENTS.	VICE-PRESIDENTS.	TREASURERS.*	SECRETARIES.*
ILFRACOMBE— July 22nd to 24th, 1879. 457 Members 34 Papers	Sir R. P. Collier, M.A.	Sir S. W. Baker, M.A., F.R.S., F.R.G.S. Rev. J. M. Chanter, M.A. J. R. Chanter, Esq. G. Doe, Esq. Rev. Treasurer Hawker, M.A. T. Hole, B.A., Esq. W. Huxtable, Esq. Chairman Ilfracombe Local Board of Health (R. Lake, Esq.) Rev. B. Price, M.A. J. Brooking Rowe, Esq., F.R.S.A., F.L.S. P. Stoneham, Esq., F.R.C.S. Rev. H. W. Toms, M.A.	E. Vivian, Esq., M.A. C. G. Barnett, Esq.	Rev. W. Harpley, M.A. E. Slade-King, Esq. M.D.
TOTNES— July 26th to 28th, 1880. 508 Members 41 Papers	H. W. Dyke Acland, M.A., M.D., LL.D., F.R.S., ETC.	Sir R. P. Collier, M.A. The Mayor of Totnes (J. Michelmore, Esq.) E. Appleton, Esq., F.R.I.B.A. A. Champenowne, Esq., M.A., F.G.S. J. W. Chaster, Esq., J.P. F. J. Cornish-Bowden, Esq., J.P. J. Fleming, Esq., J.P. T. C. Kellock, Esq. J. B. Paige-Browne, Esq., M.A. Rev. J. Powning, B.D. Rev. J. E. Risk, M.A. J. Roe, Esq. Rev. W. Watkins. R. H. Watson, Esq., J.P. T. W. Windeatt, Esq.	E. Vivian, Esq., M.A. C. W. Croft, Esq.	Rev. W. Harpley, M.A. E. Windeatt, Esq.

* Italics indicate Local Officers.

RULES.

1. The Association shall be styled the Devonshire Association for the Advancement of Science, Literature, and Art.

2. The objects of the Association are—To give a stronger impulse and a more systematic direction to scientific enquiry in Devonshire; and to promote the intercourse of those who cultivate Science, Literature, or Art, in different parts of the county.

3. The Association shall consist of Members, Honorary Members, and Corresponding Members.

4. Every candidate for membership, on being nominated by a member to whom he is personally known, shall be admitted by the General Secretary, subject to the confirmation of the General Meeting of the Members.

5. Persons of eminence in Literature, Science, or Art, connected with the West of England, but not resident in Devonshire, may, at a General Meeting of the Members, be elected Honorary Members of the Association; and persons not resident in the county, who feel an interest in the Association, may be elected Corresponding Members.

6. Every *Member* shall pay an Annual Contribution of Half-a-guinea, or a Life Composition of Five Guineas.

7. Ladies only shall be admitted as Associates to an Annual Meeting, and shall pay the sum of Five Shillings each.

8. Every *Member* shall be entitled gratuitously to a lady's ticket.

9. The Association shall meet annually, at such a time in July and at such place as shall be decided on at the previous Annual Meeting.

10. A President, two or more Vice-Presidents, a General Treasurer, and one or more General Secretaries, shall be elected at each Annual Meeting.

11. The President shall not be eligible for re-election.

12. Each Annual Meeting shall appoint a local Treasurer and Secretary, who, with power to add to their number any Members of the Association, shall be a local Committee to assist in making such local arrangements as may be desirable.

13. In the intervals of the Annual Meetings, the affairs of the Association shall be managed by a Council, which shall consist exclusively of the following Members of the Association, excepting Honorary Members, and Corresponding Members:

(a) Those who fill, or have filled, or are elected to fill, the offices of President, General and Local Treasurers, General and Local Secretaries, and Secretaries of Committees appointed by the Council.

(b) Authors of Papers which have been printed *in extenso* in the Transactions of the Association.

14. The Council shall hold a meeting at Exeter in the month of January or February in each year, on such day as the General Secretary shall appoint, for the due management of the affairs of the Association, and the performing the duties of their office.

15. The General Secretary, or any four members of the Council, may call extraordinary meetings of their body, to be held at Exeter, for any purpose requiring their present determination, by notice under his or their hand or hands, addressed to every other member of the Council, at least ten clear days previously, specifying the purpose for which such extraordinary meeting is convened. No matter not so specified, and not incident thereto, shall be determined at any extraordinary meeting.

16. The General Treasurer and Secretary shall enter on their respective offices at the meeting at which they are elected; but the President, Vice-Presidents, and Local Officers, not until the Annual Meeting next following.

17. With the exception of the Ex-Presidents only, every Councillor who has not attended any Meeting, or adjourned Meeting, of the Council during the period between the close of any Annual General Meeting of the Members and the close of the next but two such Annual General Meetings, shall have forfeited his place as a Councillor, but it shall be competent for him to recover it by a fresh qualification.

18. The Council shall have power to fill any Official vacancy which may occur in the intervals of the Annual Meetings.

19. The Annual Contributions shall be payable in advance, and shall be due in each year on the day of the Annual Meeting.

20. The Treasurer shall receive all sums of money due to the Association; he shall pay all accounts due by the Association after they shall have been examined and approved; and he shall report to each meeting of the Council the balance he has in hand, and the names of such members as shall be in arrear, with the sums due respectively by each.

21. Whenever a Member shall have been three months in arrear in the payment of his Annual Contributions, the Treasurer shall apply to him for the same.

22. Whenever, at an Annual Meeting, a Member shall be two years in arrear in the payment of his Annual Contributions, the Council may, at its discretion, erase his name from the list of members.

23. The General Secretary shall, at least one month before each Annual Meeting, inform each member by circular of the place and date of the Meeting.

24. Members who do not, on or before the day of the Annual Meeting, give notice, in writing or personally, to the General Secretary of their intention to withdraw from the Association, shall be regarded as members for the ensuing year.

25. The Association shall, within three months after each Annual Meeting, publish its Transactions, including the Rules, a Financial Statement, a List of the Members, the Report of the Council, the President's Address, and such Papers, in abstract or *in extenso*, read at the Annual Meeting, as shall be decided by the Council.

26. The Association shall have the right at its discretion of printing *in extenso* in its Transactions all papers read at the Annual Meeting. The copyright of a paper read before any meeting of the Association, and the illustrations of the same which have been provided at his expense, shall remain the property of the Author; but he shall not be at liberty to print it, or allow it to be printed elsewhere, either *in extenso* or in abstract amounting to as much as one-half of the length of the paper, before the first of November next after the paper is read.

27. The Authors of papers printed in the Transactions shall, within seven days after the Transactions are published,

receive twenty-five private copies free of expense, and shall be allowed to have any further number printed at their own expense. All arrangements as to such extra copies to be made by the Authors with the printers to the Association.

28. If proofs of papers to be published in the Transactions be sent to Authors for correction, and are retained by them beyond four days for each sheet of proof, to be reckoned from the day marked thereon by the printers, but not including the time needful for transmission by post, such proofs shall be assumed to require no further correction.

29. Should the Author's corrections of the press in any paper published in the Transactions amount to a greater sum than in the proportion of twenty shillings per sheet, such excess shall be borne by the Author himself, and not by the Association.

30. Every *Member* shall, within three months after each Annual Meeting, receive gratuitously a copy of the Transactions.

31. The Accounts of the Association shall be audited annually, by Auditors appointed at each Annual Meeting, but who shall not be *ex officio* Members of the Council.

- Devonshire Association for the Advancement of Science, Literature,
and Art.*

VOL. XII

The copy of the Transactions for the current year, which will be forwarded to you in due course, will contain the Laws of the Association. Meanwhile I beg to call your attention to the following statements :—

(1) Every Member pays an Annual Contribution of Half a Guinea, or a Life Composition of Five Guineas.

(2) The Annual Contributions are payable in advance, and are due in each year on the day of the Annual Meeting.

(3) Members who do not, on or before the day of the Annual Meeting, give notice in writing or personally to the General Secretary of their intention to withdraw from the Association are regarded as Members for the ensuing year.

The Treasurer's Address is—EDWARD VIVIAN, Esq., Woodfield, Torquay.—I remain, Sir, your faithful Servant,

Hon. Sec.

8. The reading of any Paper shall not exceed twenty minutes, and in any discussion which may arise, no speaker shall be allowed to speak more than ten minutes.

9. Papers to be read to the Annual Meetings of the Association must strictly relate to Devonshire, and, as well as all Reports intended to be printed in the Transactions of the Association, and prepared by Committees appointed by the Council, must, together with all drawings intended to be used in illustrating them in the said Transactions, reach the General Secretary's residence not later than the 24th day of June in each year. The General Secretary shall, not later than the 7th of the following July, return to the authors all such Papers as he may decide to be unsuitable to be printed in the said Transactions, and shall send the residue, together with the said Reports of Committees, to the Association's printers, who shall return the same so that they may reach the General Secretary's residence not later than on the 14th day of the said July, together with a statement of the number of pages each of them would occupy if printed in the said Transactions, as well as an estimate of the extra cost of the printing of such Tables, of any kind, as may form part of any of the said Papers and Reports; and the General Secretary shall lay the whole, as well as an estimate of the probable number of Annual Members of the Association for the year commencing on that day, before the first Council Meeting on the first day of the next ensuing Annual Meeting, when the Council shall select not a greater number of the Papers thus laid before them than will, with the other documents to be printed in the said Transactions, make as many sheets of printed matter as can be paid for with 60 per cent. of the subscriptions, for the year, of the said probable

number of Annual Members, exclusive of the extra cost of the printing of such aforesaid Tables, which have been approved and accepted by the Council, provided the aggregate of the said extra cost do not exceed 6 per cent. of the said subscriptions; exclusive also of the printers' charge for corrections of the press; and also exclusive of the cost of printing an Index, a list of Errata, and such Resolutions passed at the next Winter meeting of the Council, as may be directed to be so printed by the said Winter Meeting.

10. Papers communicated by Members for Non-Members, and accepted by the Council, shall be placed in the Programme below those furnished by Members themselves.

11. Papers which have been accepted by the Council cannot be withdrawn without the consent of the Council.

12. The Council will do their best so to arrange Papers for reading as to suit the convenience of the authors; but the place of a Paper cannot be altered after the Programme has been settled by the Council.

13. Papers which have already been printed *in extenso* cannot be accepted, unless they form part of the literature of a question on which the Council has requested a Member or Committee to prepare a report.

14. Every meeting of the Council shall be convened by Circular, sent by the General Secretary to each Member of the Council, not less than ten days before the Meeting is held.

15. All Papers read to the Association which the Council shall decide to print *in extenso* in the Transactions, shall be sent to the printers, together with all drawings required in illustrating them, on the day next following the close of the Annual Meeting at which they were read.

16. All Papers read to the Association which the Council shall decide not to print *in extenso* in the Transactions, shall be returned to the authors not later than the day next following the close of the Annual Meeting at which they were read; and abstracts of such Papers to be printed in the Transactions shall not exceed one-fourth of the length of the Paper itself, and must be sent to the General Secretary on or before the seventh day after the close of the Annual Meeting.

17. The Author of every Paper which the Council at any Annual Meeting shall decide to print in the Transactions shall be expected to pay for all such illustrations as in his judgment the said Paper may require; but the Council may, at

their discretion, vote towards the expense of such illustrations any sum not exceeding the balance in hand as shown by the Treasurer's Report to the said Meeting, after deducting all Life Compositions, as well as all Annual Contributions received in advance of the year to which the said Report relates, which may be included in the said balance.

18. The printers shall do their utmost to print the Papers in the Transactions in the order in which they were read, and shall return every Manuscript to the author as soon as it is in type, *but not before*. They shall be returned *intact*, provided they are written on loose sheets and on one side of the paper only.

19. Excepting mere verbal alterations, no Paper which has been read to the Association shall be added to without the written approval and consent of the General Secretary; and no additions shall be made except in the form of notes or postscripts, or both.

20. In the intervals of the Annual Meetings, all Meetings of the Council shall be held at Exeter, unless some other place shall have been decided on at the previous Council Meeting.

21. When the number of Copies on hand of any 'Part' of the Transactions is reduced to twenty, the price per copy shall be increased 25 per cent.; and when the number has been reduced to ten copies, the price shall be increased 50 per cent. on the original price.

22. The Association's Printers, but no other person, may reprint any Committee's Report printed in the Transactions of the Association, for any person, whether a Member of the said Committee, or of the Association, or neither, on receiving, in each case, a written permission to do so from the Honorary Secretary of the Association, but not otherwise; that the said printer shall pay to the said Secretary, for the Association, sixpence for every fifty copies of each half sheet of eight pages of which the said Report consists; that any number of copies less than fifty, or between two exact multiples of fifty, shall be regarded as fifty; and any number of pages less than eight, or between two exact multiples of eight, shall be regarded as eight; that each copy of such Reprints shall have on its first page the words "Reprinted from the Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art for ——— with the consent of the Council of the Association," followed by the date of the year in which

the said Report was printed in the said Transactions, but that, with the exception of printers' errors, and changes in the pagination which may be necessary or desirable, the said Reprint shall be in every other respect an exact copy of the said Report as printed in the said Transactions, without addition, or abridgment, or modification of any kind.

23. The General Secretary shall, within one month after each Annual General Meeting, inform the Hon. Local Treasurer and the Hon. Local Secretary, elected at the said Meeting, that, in making or sanctioning arrangements for the next Annual General Meeting, it is eminently desirable that they avoid and discourage everything calculated to diminish the attendance at the General and Council Meetings, or to disturb the said Meetings in any way.

24. The Bye-Laws and Standing Orders shall be printed after the "Rules" in the Transactions.

25. All resolutions appointing committees for special service for the Association shall be printed in the Transactions next before the President's Address.

REPORT OF THE COUNCIL,

As presented to the General Meeting, Totnes, 1880.

THE Eighteenth Annual Meeting of the Association was held at Ilfracombe, commencing on Tuesday, July 23rd. The heavy and long-continued rains, which had up to this day inundated the entire country, ceased with the advent of the Association to this pleasant watering-place, and a bright and glorious sunshine prevailed during the whole of the visit.

The proceedings commenced at the Townhall at one o'clock with the reception of the members by the members of the Local Board of Health, representing the inhabitants of Ilfracombe. Mr. Lake, the Chairman, heartily welcomed the Association and Mr. Barnet, the Clerk of the Board, read an address which had been prepared. To this Mr. Batten, as the senior Vice-President present, and Mr. Pengelly, as the oldest Ex-President, responded in suitable terms.

At 2 p.m. a Council Meeting was held, when Committees were appointed, thirty-four Papers and Reports were accepted, and other formal business was transacted. A General Meeting of the Members followed, at four o'clock, when very satisfactory Reports were presented by the Council and Treasurer.

In the evening, at 8 o'clock, the President, Sir R. P. Collier, delivered his Introductory Address in the Townhall to a large and appreciative gathering.

On Wednesday, at 11 a.m., the reading and discussion of the following programme of Papers was commenced. The Reports of Committees were first taken, and in compliance with the decision of the Council of the previous day there was no discussion on any of them, but questions respecting them were asked and answered.

Fourth Report of Committee on Devon- shire Meteorology	} Dr. Lake.
Fourth Report of Committee on Scien- tific Memoranda	
Fourth Report of Committee on Devon- shire Folk-Lore	} W. Pengelly, F.R.S., F.G.S.
	} G. Doe.

Third Report of Committee on Devonshire Celebrities . . .	<i>Rev. Treasurer Hawker, M.A.</i>
Third Report of Committee on Dartmoor . . .	<i>W. F. Collier.</i>
Third Report of Committee on Verbal Provincialisms . . .	<i>F. H. Firth.</i>
First Report of Committee on Barrows	<i>R. N. Worth, F.G.S.</i>
Notes on the Older Times of Ilfracombe	<i>Mrs. Slade-King.</i>
The North Devon Fleet in 1588 . . .	<i>R. W. Cotton.</i>
History of the Classification and Nomenclature of the North Devon Rocks . . .	<i>T. M. Hall, F.G.S.</i>
Vestiges of an Early Guild of St. Nicholas at Barnstaple, A.D. 1303	<i>J. R. Chanter.</i>
The Parish Expenditure of Milton Abbot, Devon, for the year 1588 . . .	<i>W. Pengelly, F.R.S., &c.</i>
Bishop Jewel's Birthplace . . .	<i>Rev. Treasurer Hawker, M.A.</i>
"Manly Peeke, of Tavistock" . . .	<i>J. Brooking Rowe, F.S.A., F.L.S.</i>
On the Geology of the Ilfracombe Coast-line . . .	<i>T. M. Hall, F.G.S.</i>
Lydford and its Castle . . .	<i>R. N. Worth, F.G.S.</i>
Archæological Discoveries in Exeter, 1878-9 . . .	<i>E. Parfitt.</i>
On a Block of Granite from the Salcombe Fishing Grounds . . .	<i>Arthur Roope Hunt, M.A., F.G.S.</i>
The Metamorphosis of the Rocks extending from Hope Cove to Start Bay, South Devon . . .	<i>W. Pengelly, F.R.S., &c.</i>
Collectanea curiosa Devonienisia. Partii.	<i>P. Q. Karkcek.</i>
State of the Volunteers of Devonshire in the year 1803 . . .	<i>A. H. A. Hamilton.</i>
Notes on some Errors relating to North Devon . . .	<i>T. M. Hall, F.G.S.</i>
Notes on Slips connected with Devonshire . . .	<i>W. Pengelly, F.R.S., &c.</i>
Historical Documents relating to Dartmoor . . .	<i>R. Dymond, F.S.A.</i>
Fossil Plant discovered near Sidmouth	<i>P. O. Hutchinson.</i>
The Fauna of Devon— <i>Neuroptera</i> . . .	<i>E. Parfitt.</i>
On the Deposits of Petrockstow in Devon . . .	<i>W. A. E. Ussher, F.G.S.</i>
Note on the Occurrence of Granite Boulders near Barnstaple, and of a Vein of Granitoid Rock at Portledge . . .	<i>T. M. Hall, F.G.S.</i>
The Limestones of Westleigh and Holcombe Rogus . . .	<i>Rev. W. Downes, B.A., F.G.S.</i>
Hoker's Journal of the House of Commons in 1571 . . .	<i>J. B. Davidson, M.A.</i>
The Manor House, Berrynarbor . . .	<i>Rev. Treasurer Hawker, M.A.</i>
Notes on the History of Printing in Devon . . .	<i>R. N. Worth, F.G.S.</i>
Sessile-Eyed Crustacea of Devon, Supplementary List . . .	<i>Rev. T. R. R. Stebbing, M.A.</i>
Notes on Recent Notices of the Geology and Palæontology of Devonshire. Part VI.	<i>W. Pengelly, F.R.S., &c.</i>

In the evening the members dined together at the Ilfracombe Hotel, the Rev. Treasurer Hawker presiding. Ninety

sat down, including many ladies, and every one agreed that neither in the elegance and convenience of the room, nor the variety and excellence of the viands, had any previous dinner surpassed the dinner then served by the manager of the Hotel, Mr. Cleave.

On Thursday, at 10 a.m., the reading of papers was resumed. There was again a large attendance, and much interest was manifested in the proceedings. Soon after three o'clock the reading of papers was completed, and a General Meeting having been held, at which votes of thanks were passed to the Local Committee, to the Local Officers, and to the Rev. Treasurer Hawker, who had officiated as President since the departure of Sir. R. P. Collier, a Meeting of the Council immediately followed, and concluded the formal business of the Meeting.

The proceedings of the day were most agreeably brought to a close by a visit to the delightful Rectory at Berry Narbor, where the Rev. Treasurer and Mrs. Hawker gave the Members of the Association a most cordial welcome. *En route* the caves at Watermouth were visited; and at Berry Narbor the interesting Church and ancient Manor House inspected.

On Friday the members availed themselves of several excursions which had been arranged by the Local Committee. A party of twenty, under the guidance of Mr. W. Huxtable, left the Clarence Hotel, in special conveyances, at 8 a.m., for Lynton. After lunching at Lynton, they drove to Oare, visiting Countesbury Hill on the way. From Oare they walked across the moor to the site of the Doone Encampment, and down the valley through Badgeworthy Wood, Malmsmead, Brendon, Rockford, and Watersmeet to Lynmouth, a distance of about ten miles. Having dined at Lynton, they started for Ilfracombe, about 7 p.m., where they arrived well pleased with their outing.

Another numerous party, conducted by Mr. Townshend M. Hall, journeyed to Morthoe. On arriving at Morthoe Station, they were conveyed in breaks to Morthoe Church, where the Rev. T. P. Andrews, the Curate-in-charge, requested Mr. Townshend Hall to say a few words about the antiquities of the church. Mr. Hall complied, and delivered a lucid and instructive address. The party then went to Barrican Bay, where the shell-beach was examined, and then to a so-called cromlech at the top of the hill above Woolacombe, which was found to consist of a large block of white quartz resting on two smaller blocks. After partaking of refreshments at the Chichester Arms, the party proceeded to visit another

reputed cromlech near Morte Point. Subsequently some of the better walkers found their way to Rockham Bay, where an exceedingly pleasant day's outing came to an end. The whole party left Morthoe in the evening for their homes.

A third party, though only a small one, joined an excursion conducted by Mr. T. Wainwright. The toilsomeness of the walk over Braunton Burrows and the Down and cliffs was sufficient to deter all but the most enthusiastic naturalists. Proceeding first to the church, the visitors were courteously received by the vicar, the Rev. J. W. R. Landon, and the curate, the Rev. H. Hazard, who pointed out the various objects worthy of note in this interesting old church. From the church the party drove to the commencement of the Burrows at the end of Sandy-Lane, and the work of botanical exploration began. Mr. Wainwright conducted the visitors to the habitats of a large number of the rarer plants, nearly all of which were met with in flower. In the Saunton cliffs the attractions to geologists are the granite boulder and the raised beach. Proceeding hence along the northern edge of the burrows, the excursionists arrived at, and duly admired, Saunton Court. Driving hence to Braunton, the residence of E. Mack, Esq., the churchwarden, was reached. The party was kindly received by this gentleman, and shown some interesting churchwardens' accounts, commencing about 300 years ago, as well as the ancient ordinances for the Manor of Braunton. Mr. Wainwright having read a few interesting notes he had made on the history of the parish of Braunton, the party dispersed to their homes, all agreeing that the pleasure they had received more than compensated for the fatigue they had endured.

It having been decided that the next Annual Meeting should be held at Totnes, the following were elected officers for that occasion :

President : H. W. Dyke Acland, Esq. M.A., M.D., LL.D., F.R.S., &c. Vice-Presidents : The Worshipful the Mayor of Totnes (J. Michelmores, Esq.) ; E. Appleton, Esq., F.R.I.B.A. ; A. Champenowne, Esq., M.A., F.G.S. ; J. W. Chaster, Esq., J.P. ; The Right Hon. Sir R. P. Collier, M.A. ; F. J. Cornish-Bowden, Esq., J.P. ; J. Fleming, Esq., J.P. ; T. C. Kellock, Esq. ; J. B. Paige-Browne, Esq., M.A. ; Rev. J. Powning, B.D. ; Rev. J. E. Risk, M.A. ; J. Roe, Esq. ; Rev. W. Watkins ; R. H. Watson, Esq., J.P. ; T. W. Windeatt, Esq. Hon. Treasurer : E. Vivian, Esq., M.A., *Torquay*. Hon. Local Treasurer : C. W. Croft, Esq. Hon. Secretary : Rev. W. Harpley, M.A., F.C.P.S., *Clayhanger, Tiverton*. Hon. Local Secretary : E. Windeatt, Esq.

The Council have published the President's Address, together with Obituary Notices of members deceased during the year preceding, and the Reports and Papers read before the Association; also the Treasurer's Report, a List of Members, Committees for special purposes, and the Rules, Standing Orders and Bye-Laws, forming the eleventh volume of the *Transactions* of the Association. A copious Index, prepared by Mr. P. O. Hutchinson, has since been added.

A Copy of the *Transactions* and *Index* has been sent to each Member, and the following Societies: The Royal Society, Linnæan Society, Geological Society, Anthropological Institute of Great Britain and Ireland, Royal Institution (Albemarle Street), Devon and Exeter Institution (Exeter), Plymouth Institution, Torquay Natural History Society, Barnstaple Literary and Scientific Institution, Royal Institution of Cornwall (Truro), and the Library of the British Museum.

In concluding their Report, the Council desire to mention, as a subject for congratulation and thankfulness, the comparatively small number of Members who have been lost to the Association by death during the past twelve months. Only three names have to be recorded this year, as compared with ten in the year preceding.

Treasurer's Report of Receipts and Expenditure during the Year ending 27th July, 1880.

RECEIPTS.		£	s.	d.
Balance in Treasurer's hand 18th July, 1880	.	37	14	1
Arrears of Annual Contributions for 1878-9	.	4	14	6
Annual Contributions for 1879-80	.	173	15	6
Prepaid Annual Contributions for 1880-1	15	15	0	
ditto 1881-2	1	1	0	
Ladies' Tickets sold at Ilfracombe	.	16	16	0
Life Compositions	.	1	15	0
Donation	.	15	15	0
Sale of "Transactions," 2 copies for 1862	0	4	0	
Ditto 1863	0	6	0	
Ditto 1864	0	9	0	
Ditto 1865	0	7	6	
Ditto 1866	0	9	0	
Ditto 1867	0	18	0	
Ditto 1868	0	13	0	
Ditto 1869	1	4	0	
Ditto 1870	0	12	0	
Ditto 1871	0	13	0	
Ditto 1872	1	10	0	
Ditto 1873	0	12	0	
Ditto 1874	0	17	0	
Ditto 1875	0	10	0	
Ditto 1876	1	4	0	
Ditto 1877	0	18	0	
Ditto 1878	1	10	0	
Interest on Deposit at Torquay Bank to June 30, 1880		12	16	6
		7	14	5
Annual Contributions unpaid for 1878-9	.	3	3	0
ditto 1879-80	.	13	13	0
Ditto		16	16	0

We have compared the Books and Vouchers presented to us, and found them correct,

July 24th, 1880.

(Signed) GEO. F. HEARDER, } AUDITORS.
EDWARD APPLETON, }

EXPENDITURE.		£	s.	d.
Deposited at Interest in Torquay Bank	.	35	0	0
Brendon & Son for Printing "Transactions," vol. xi. (1879)	.	143	0	0
Ditto Index to vol. x. (1878)	.	2	17	6
Ditto Cards, Circulars, &c.	.	4	8	6
Ditto Postage and Carriage of Parcels	17	7	6	
Ditto Stationery	.	0	13	6
Milligan and Co. for Printing Programmes	.	168	7	0
Robinson for Printing Circulars	.	0	15	0
Torquay Directory Co. for Printing Receipt Forms	.	0	10	0
Townsend for Printing Circulars	.	1	0	0
Insurance	.	0	5	0
Hon. Gen. Treasurer for Petty Expenses	.	6	4	4
Hon. Gen. Secretary ditto	.	6	10	9
Advertising in 1879	.	5	0	6
Balance in Treasurer's hand 24th July, 1880	.	47	3	5

(Signed) EDWARD VIVIAN, TREASURER.
24th July, 1880.

£271 11 0

STATEMENT OF THE PROPERTY OF THE ASSOCIATION,

July 27th, 1880.

	£	s.	d.
Deposit at Interest in Torquay Bank (Life Compositions of Fifty-two Members)	260	0	0
Balance in Treasurer's hand * (24th July, 1880)	47	3	5
Arrears of Annual Contributions (valued at)	7	7	0
"Transactions" in Stock, 1862 ... 8 copies at 2s. 0d.	0	16	0
" " 1863 ... 100 " 2s. 0d.	10	0	0
" " 1864 ... 111 " 3s. 0d.	16	13	0
" " 1865 ... 107 " 2s. 6d.	13	7	6
" " 1866 ... 84 " 3s. 0d.	12	12	0
" " 1867 ... 82 " 6s. 0d.	24	12	0
" " 1868 ... 55 " 6s. 6d.	17	17	6
" " 1869 ... 3 " 12s. 0d.	1	16	0
" " 1870 ... 32 " 6s. 0d.	9	12	0
" " 1871 ... 32 " 6s. 6d.	10	8	0
" " 1872 ... 1 " 15s. 0d.	0	15	0
" " 1873 ... 39 " 6s. 0d.	11	14	0
" " 1874 ... 42 " 8s. 6d.	17	17	0
" " 1875 ... 21 " 10s. 0d.	10	10	0
" " 1876 ... 24 " 12s. 0d.	14	8	0
" " 1877 ... 25 " 6s. 0d.	7	10	0
" " 1878 ... 11 " 10s. 0d.	5	10	0
" " 1879 ... 32 " 7s. 0d.	11	4	0
Due for "Transactions" sold	0	0	0
	<u>£511</u>	<u>12</u>	<u>5</u>

(Signed)

W. HARPLEY,

Hon. Secretary.

"When the number of copies on hand of any part of the 'Transactions' is reduced to twenty, the price per copy shall be increased 25 per cent.; and when the number has been reduced to ten copies, the price shall be increased 50 per cent."—*Standing Order, No. 21.*

The "Transactions" in Stock are insured against fire in the sum of £200.

* The balance in the Treasurer's hand (£47 3s. 5d.) is indebted to Capital to the amount of £60 7s. 6d. (= Life Compositions, £42 + Prepaid Annual Contributions, £18 7s. 6d.)

SELECTED MINUTES OF COUNCIL, APPOINTING COMMITTEES.

Passed at the Meeting at Totnes.

JULY, 1880.

7. That Dr. W. Dyke Acland, Mr. C. Spence Bate, Ven. Archdeacon Earle, Rev. W. Harpley, Rev. Treasurer Hawker, and Mr. W. Pengelly be a Committee for the purpose of considering at what place the Association shall hold its Meeting in 1882, and who shall be invited to be the Officers at that Meeting; that Mr. Pengelly be the Secretary; and that they be requested to report to the next Winter Meeting of the Council.

8. That Mr. George Doe, Rev. W. Harpley, Mr. N. S. Heineken, Mr. H. S. Gill, Mr. E. Parfitt, and Mr. J. Brooking Rowe be a Committee for the purpose of noting the discovery or occurrence of such Facts in any department of scientific inquiry, and connected with Devonshire, as it may be desirable to place on permanent record, but which may not be of sufficient importance in themselves to form the subjects of separate papers; and that Mr. J. Brooking Rowe be the Secretary.

9. That Mr. P. F. S. Amery, Mr. George Doe, Mr. R. Dymond, Rev. W. Harpley, Mr. P. Q. Karkeek, and Mr. J. Brooking Rowe be a Committee for the purpose of collecting notes on Devonshire Folk-Lore; and that Mr. George Doe be the Secretary.

10. That Mr. R. Dymond, Rev. Treasurer Hawker, Mr. P. Q. Karkeek, Sir J. H. Kennaway, Mr. E. Windeatt, and Mr. R. N. Worth be a Committee for the purpose of compiling a list of deceased Devonshire Celebrities, as well as an Index of the entire Bibliography having reference to them; that the list consist exclusively of Celebrities born in Devonshire; and that the Rev. Treasurer Hawker be the Secretary.

11. That Mr. R. Dymond, Mr. A. H. A. Hamilton, Rev. Treasurer Hawker, and Mr. R. N. Worth be a Committee to prepare a Report

on the Public and Private Collections of Works of Art in Devonshire; and that Mr. Dymond be the Secretary.

12. That Mr. J. S. Amery, Mr. C. Spence Bate, Mr. W. F. Collier, Mr. J. Divett, Mr. R. Dymond, Mr. F. H. Firth, Rev. W. Harpley, Rev. Treasurer Hawker, Mr. W. Lavers, Mr. G. W. Ormerod, Mr. J. Brooking Rowe, and Rev. W. H. Thornton be a Committee for the purpose of collecting information on all matters of interest appertaining to Dartmoor, especially on its Anthropology, Archæology, Biology, Geography, Geology, Industries, Public Rights of Way, &c., and the Tenures of the Land; that for the purposes of the said Committee "Dartmoor" shall be regarded as consisting inclusively and exclusively of the entire parishes of Ashburton, *Belstone*, Bovey Tracey, *Bridestowe*, Bridford, *Buckfastleigh*, Buckland-in-the-Moor, Buckland Monachorum, *Chagford*, Cornwood, *Dean Prior*, Drewsteignton, *Gidleigh*, Harford, *Holne*, Islington, Lamerton, Lustleigh, *Lydford*, *Manaton*, Mary Tavy, *Meavy*, Moretonhampstead, *North Bovey*, Okehampton, *Peter Tavy*, *Sampford Spiney*, *Shaugh Prior*, *Sheepstor*, *Sourton*, *South Brent*, *South Tawton*, *Tavistock*, *Throwleigh*, Ugborough, *Walkhampton*, *Whitchurch*, and *Widcombe-in-the-Moor*; and that Mr. W. F. Collier be the Secretary.

N.B. Italics indicate Venville parishes.

13. That Mr. J. S. Amery, Mr. G. Doe, Mr. R. Dymond, Mr. F. T. Elworthy, Mr. F. H. Firth, Mr. P. O. Hutchinson, Mr. P. Q. Karkeek, and Dr. W. C. Lake be a Committee for the purpose of noting and recording the existing use of any Verbal Provincialisms in Devonshire, in either written or spoken language, not included in the lists published in the Transactions of the Association; that Mr. F. T. Elworthy be the Editor, and that Mr. F. H. Firth be the Secretary.

14. That Mr. J. S. Amery, Mr. J. B. Davidson, Mr. G. Doe, Mr. R. Dymond, Ven. Archdeacon Earle, Rev. W. Harpley, Mr. J. S. Hurrell, Mr. P. O. Hutchinson, Mr. J. Brooking Rowe, and Mr. R. N. Worth be a Committee for editing and annotating such parts of *Domesday Book* as relate to Devonshire; and that Mr. J. Brooking Rowe be the Secretary.

15. That Mr. C. Spence Bate, Mr. G. Doe, Mr. P. O. Hutchinson, Mr. E. Parfitt, Mr. J. Brooking Rowe, and Mr. R. N. Worth be a Committee to collect and record facts relating to Barrows in Devonshire, exclusive of Dartmoor as defined in the twelfth minute (see above), and to take steps, where possible, for their investigation; and that Mr. R. N. Worth be the Secretary.

16. That Mr. G. Doe, Mr. R. Dymond, Mr. A. W. Hurrell, Mr. G. W. Ormerod, Mr. J. Brooking Rowe, and Mr. E. Windeatt be a Committee to obtain information as to the peculiar tenures of land,

and as to customs of Manor Courts, in Devonshire, exclusive of Dartmoor as defined in the twelfth minute (see above), and that Mr. E. Windeatt be the Secretary.

17. That Mr. F. H. Firth, Rev. W. Harpley, Mr. H. Tozer, Mr. R. C. Tucker, and Mr. J. S. Whidborne be a Committee for the purpose of making the arrangements for the Association Dinner at Dawlish in 1881 ; and that Mr. R. C. Tucker be the Secretary.

22. That Mr. R. Dymond, Rev. W. Harpley, Mr. W. Pengelly, and Mr. E. Vivian be a Committee to consider the question of the Deposit Account of the Association, and the appointment of Trustees ; that the Rev. W. Harpley be the Secretary ; and that they be requested to report to the next Winter Meeting of the Council.

PRESIDENT'S ADDRESS.

LADIES AND GENTLEMEN,—The wide range of knowledge, and the high aims of thought, which the Devonshire Association for "Science, Literature, and Art" seeks to promote, impose on all who attend its meetings, and on those especially who by your favour are called upon to address you, no small responsibility.

There are two methods, one or other of which is generally followed in an address introductory to such a meeting. The first is, to take up a special subject for consideration; the second is, to consider more generally the present condition or progress of Science, of Literature, or of Art.

It is not proposed on this occasion to follow either of these courses, but to consider during our brief time *what are the relations which Science, Literature, and Art bear one to the other in modern thought*. The attempt may perhaps seem to be rash, and one which ought to be undertaken only by such persons as could speak with some authority on all. But it may be not without use that one who has no such claim in any of your three subjects, but who has had many opportunities for observing the progress of all, should attempt to convey the impression which the growth of modern thought in this direction has made upon him during a long working life.

It might appear at first sight that the terms Science, Literature, and Art included the whole of human knowledge. And in a certain sense it is true that almost every department of knowledge, of action, or of free-will, might be properly classed under one or other of these great divisions.

Politics, for instance, have a scientific as well as a practical side. Philosophic enquirers endeavour to establish principles which aim at promoting the highest good of man, while practical politics range from wise and experienced statesmanship down to the baser schemes of designing demagogues.

Medicine too has a Science, the roots of which lie in the comprehension and mastery of Nature in most widely-extended relations, with a Practice capable of being brought down from the level of wise usefulness to that of imposture or superstition.

But each of the divisions of human thought and human knowledge which are under consideration have limitations which should be laid down with care, and illustrated with judgment.

And, first, I may define for the present purpose—

Science as organized knowledge.

Literature as the record of cultured thought bearing chiefly on human interests.

Art as the appreciable expression of that which is beautiful in any department of human energy.

As regards the progress of Physical Science, it must be conceded that, notwithstanding the truly astonishing accumulation and growth of human knowledge concerning the material world from the time of Eratosthenes and Aristotle to that of Bacon, Newton, and Linnæus, the mass of accurate conclusions, depending on precise data, has increased in the last hundred years in a manner without precedent, and wholly baffling any complete description. The reason of this will hereafter appear.

In two more decades this century will be ended. Facile locomotion, and instantaneous intercommunication with nearly all parts of the world, will have changed the thoughts and habits of every tribe of the human race wherever situate. A knowledge of the chief laws of the material world, of the configuration of the universe, of the material history of man, will, by the help of elementary schools and scientific primers, have permeated the masses of every civilized community. Ancient beliefs on many things will have been shaken, revised, new modelled. Fundamental laws of Sociology will have been rediscussed, and, wherever ancient usages and associations are supposed to interfere with modern material knowledge, will be more or less modified.

The statement of a few principles, and the consideration of a few illustrations, will serve to show the character and present attitude of physical science as compared with much of that of former periods. Scientific enquirers were doubtless engaged at all times in seeking the causes as well as the nature of things. But these causes were in ancient times made matter of speculation and imagination, not of actual observation and experiment. The older cosmogonies were

framed on arguments derived from the probable and assumed rather than the actual and proved. The strictness of logical conclusions was held to be of more account than honest labour in ascertaining the correctness of the data on which the conclusions were built. It is now far otherwise. No assertion in Science stands long unchallenged. Speculations or hypotheses are counted as mere slaves, employed and dismissed.

The conception of the framework of the universe depends now on a series of observations of a kind which fifty years ago were unattainable and, for the most part, unimagined. The dimensions with which we have to deal are in truth inconceivable, yet they must be briefly stated in the outset. They demand a concentration of attention of no ordinary kind.

We may attempt to realize them by taking familiar objects such as the Sun and Moon. The distance of the Moon from the Earth is about 240,000 miles. The diameter of the Sun is about 858,000.

A man can now easily travel round the earth in three months, or ninety days. At the same rate it would take him to go round the Sun above twenty-seven years; or, put in another way, the distance of the Moon from the Earth is between a third and a fourth of the diameter of the Sun. Probably there are Stars some thousands of times larger than the Sun. The Solar System is but as a speck in the system of the Stars. The visible Stars have been calculated as something fewer than fifty millions. There is no reason for supposing that all the stars which exist can by any human means become known to us. Moreover each Star may be the centre of a system greater than our own. "A general conception of the distribution of the stars around our system," Mr. Stone, the distinguished astronomer, writes to me, "can be formed by supposing a set of thin Strata, of great extension, arranged nearly parallel to the Milky Way, and with the number of Stars in any given space, and the Star density, rapidly decreasing as we separate from the Stratum which contains the Milky Way." Our little Solar System is near the middle of this universe of Stars, as far as we are able to judge. The component parts of the universe are in constant motion—a motion in some parts so rapid as almost to defy expression, and such as at present is inexplicable from any data which we possess.

Without a knowledge of the data which have been accumulating since the discovery of the telescope, philoso-

phers of every period have speculated on the origin of the Matter of which this inconceivable mass of countless systems of worlds is composed. Of the origin of this Matter modern Science tells us actually nothing. What we first know of it is, it has its being, it moves—it moves in a way which is seemingly absolute, necessary. This way, so far as we know, is the same unchanged from age to age. The “laws,” it is said, are the same at all time and everywhere. But this assertion rests in great part on man’s limited experience. What has occurred before this experience is unknown. What will occur we can only conclude with safety, on the double assumption that we have all the data, and that these data will undergo no change.

Some forty years ago a work called *Vestiges of Creation*, from the boldness of its speculations and the beauty of its collected facts, caused no small stir among educated persons unacquainted with Physical Science. It appeared shortly after men had begun to doubt the correctness of the interpretation put on the Mosaic Cosmogony. That Cosmogony, so simple, so grand, so consonant under certain limitations with advancing knowledge derived from actual observation, constructed and peopled our planet with living things. Of the stellar universe it implied something, but too faintly for analytic discussion; it could not have been intended for scientific instruction.

In modern times, beginning perhaps with Kant, the Nebular hypothesis of the Universe has received general acceptance. This hypothesis is that the Nebulæ which we find in various parts of the Heavens are collections of matter loosely aggregated, and generally undergoing the process of being condensed into more solid bodies. These bodies are to become Stars. These Stars may be like our Sun, with planetary bodies revolving about them like our Planets and our Earth. The processes which have to be gone through in the condensation of this nebular universe of incandescent matter are still under discussion. But much is known of them. Either the central mass (or Sun) was formed first, or the revolving planetary bodies. There are reasons, arising from recent observations, for supposing that either may have been the case. But in any case a series of consecutive condensations in the rarer nebulous material took place, leading up to the orderly and consecutive evolutions which we now know for certain to have occurred in our globe.

It is the nature of this comparatively sure knowledge, and the mode of its ascertainment, that we have to consider. It

has been established without question, that within our system, and, as we may infer, within the Universe, no loss occurs in either Matter or in Energy. Matter is in its combinations ever undergoing change. Energy takes new forms and development. It must open to any intelligent mind a new world of wonder and of thought when it first realizes that Heat, and Light, and Gravitation operate in the most distant orbs as they do in our Solar Centre, which maintains the Earth and her sister Planets in their courses, and makes Life on our globe possible and continuous, and produces results, as we shall see, progressive in their character.

The observations which have been made within the last twenty years by the Spectroscope, in great measure by the skill and perseverance of Dr. Huggins, tell of similar constitution of Matter, the same effects of Heat, the same properties of Light, in Stars and in Nebulæ as in the Sun and in the Earth.

From these and other observations it is inferred that, as the nebulous matter was condensed from incandescent material, a process of cooling took place. Heat could not be emitted without loss of volume in the mass which produced it. This implies change; it implies motion. The heat which reaches the Earth is so much heat lost to the Sun. The Earth is warmed and the Sun is cooled. The extent to which the Sun has cooled and the extent to which it may have diminished in volume has been calculated with great exactness. The calculation has been made from data attainable by direct observation on the rate of increase of temperature as we descend into the Earth. They are mainly due to the genius and learning of Sir William Thompson.

While it must be admitted that some of these statements—condensed and therefore rude—may hereafter require modifications, they lead irresistibly to the conclusion that our Earth has been gradually formed out of a heated mass, cooling at the surface and undergoing definite and orderly changes in its crust. These changes, the study of a science almost created in our own day, are in the course of being described, in the most precise manner, in every portion of the globe.

The position and thickness of early igneous rocks, the first product of the contracted mass, is becoming known over a considerable portion of the world. The undulations and upheavals of this crust (perhaps about forty-five miles in thickness); the penetration through the crust of this still molten volcanic mass; the dislocations thereby of the exterior; the successive deposits formed in tens of thousands of

years in the uneven hollows of the surface; the gradual appearance of life in the successive so-called layers or strata; the structure of the beings, whether sentient or non-sentient, so appearing; their similarities and their differences,—are all being duly noted in every part of the earth, the rivers, the lakes, and the sea. The regions which are suitable to the different forms of life are recorded. The conditions which seem to accompany the appearance of one form and the disappearance of another—conditions of temperature, moisture, elevation, soil, inheritance—are becoming understood in every civilized spot of the globe, nay, in every spot which civilized man can reach—not only as regards the present state of the earth's surface, but in reference to its conditions in previous periods. The duration of the periods is being calculated. The length of time which it took the water to deposit the clay or the minute organisms to form the chalk, the depths of the clays and the thickness of the chinks, these are subjects of enquiry and of conclusions; enquiry carried on with every aid of precise instruments and previous training, conclusions tested by every criticism which honest acumen or fierce partizanship can apply.

The recent increase of our actual knowledge in these directions is astonishing. Professor Prestwich, for instance, lately pointed out, that whereas in the year 1822 only 752 species of organic remains had been recorded as previously existing in this country, in the year 1874 no fewer than 13,276 species had been described. Mr. Etheridge informs me that since 1874 they have now (1880) been increased to 14,142. Within a shorter time a still greater change, now universally accepted, has been made in our ideas as to the early History of Man on the Globe. Though this subject is far from complete—indeed is only in a “robust infancy”—yet we now know that Man existed at periods far antecedent to any that had even a few years ago been imagined; viz., at a time when the climate of the different parts of the globe and the distribution of animal life were very different from those now existing. This subject is specially interesting to Devonshire men, since MacEnery, Buckland, and especially Pengelly, have, by their researches in connection with it, made this district for ever famous in the History of Science.

Though time will not allow any complete detail to be given of the methods of work in any one of the departments of Science thus hinted at, it may be well to cite three, as examples of the mixed character of accurate enquiry and consequent result or hypothesis which modern Science presents.

1. The modern Theory of Atoms.
2. The recent enquiries into the Development of Living Beings.
3. The scientific hypotheses on which certain Diseases are to be prevented.

It was said above that it requires a special attitude of mind to grasp the vast dimensions and the distances with which we have to deal in considering the distribution of Bodies through the Universe as a whole. An analogous but different effort is called for in considering the ultimate constitution of the Matter of which these Bodies are composed.

In one of the essays, charming from their lucidity and force, in which Maxwell, *valde deflendus*, treats of the constitution of Matter, he says, "We begin by assuming that bodies are made up of parts, each of which is capable of motion, and that these parts act on each other in a manner consistent with the principle of conservation of energy. In making these assumptions we are justified by the fact that bodies may be divided into smaller parts, and that all bodies with which we are acquainted are conservative systems, which would not be the case unless their parts were conservative systems. . . . We may also assume that these small parts are in motion. . . . We make no assumption with respect to the nature of the small parts—whether they are all of one magnitude. We do not even assume them to have extension and figure. Each of them must be measured by its mass, and any two of them must, like visible bodies, have the power of acting on one another when they come near enough to do so. . . . The first step in the investigation is to determine the amount of motion which exists among the small parts independent of the visible motion of the medium as a whole."*

On investigation of the properties of Gases the hypothesis is proposed that they consist of molecules in motion. It is hardly possible to raise an argument against this. The nature and the velocity alone seem to be capable of question. It is almost susceptible of proof that the Molecules (*e.g.* of Hydrogen) are of equal masses. When in motion if they have not equal masses they have nevertheless equal velocities. The distance that the Molecules travel without collision is believed to be (under certain conditions of temperature and pressure) "in the case of Hydrogen the 25,000th of an inch, or about $\frac{1}{5}$ part of a wave of green light." The actual diameter of the Molecules has been estimated by Sir W. Thompson (1870) from considerations derived from the thickness of

* *Encyclopædia Britannica*, vol. iii. 1875, p. 38.

soap bubbles, and the electric action between zinc and copper. From these enquiries it is concluded that 2,000,000 Molecules of Hydrogen would occupy a $\frac{1}{32}$ of an inch, and 200,000,000,000,000,000,000 weigh a $\frac{1}{32}$ of a gram. These are compared with what we can see with the microscope. M. Nobert can draw 4000 lines in the breadth of a millimetre ($\frac{1}{25}$ inch). "A cube whose side is the 4000th of a millimetre may be taken as the minimum visible for observers of the present day." "Such a cube would contain from 60 to 100 million Molecules of Oxygen;" "but since the Molecules of organized substances contain on an average about fifty of the more elementary atoms, we may assume that the smallest organized particle visible under the microscope contains about two million Molecules of organic matter." Into the physiological conclusions to be drawn from this statement it is not the time now to enter.

Maxwell has elsewhere shown, in his graphic way, that, from these and other considerations of properties too intricate and detailed to be here noticed, the Molecules of Air (in a room for instance) are rushing in all directions at the rate of about seventeen miles a minute, a rate exceeding that of a cannon-ball. They only do not destroy therefore all with which they come in contact, because by perpetual collision one with the other, and by constant change of direction, they neutralize each other's force, and maintain just that pressure which is necessary for our existence.

The subject must not be quitted without the remark that, however startling may be the facts and numbers here brought forward by Maxwell, they shrink into insignificance when compared with those now under consideration by Mr. Crookes, who has endeavoured to prove by experiment the existence of particles of matter as much smaller than gaseous Molecules as they are than those of solid bodies.

The second instance of Scientific enquiry and result to be named is that of the DEVELOPMENT of organized beings. All organized beings, all having either life, or life and consciousness, are necessarily constructed of the matter of the planet on which they are placed, matter that is collected together in the manner already indicated, and having properties ultimately derived from the Molecules that have been described.

The smallest organic matter visible is calculated by Professor Beale to be less than the $\frac{1}{100,000}$ of an inch in diameter. The actual size of these potential germinal particles is worth noting. The dimension of $\frac{1}{100,000}$ of a linear inch

means that a cubic inch would contain very many million times as many particles as the whole of the human species living now on the globe. But each particle possesses properties of its own, is probably capable of development, and, as far as we yet know, it must have been derived from a parent stock to which itself becomes more or less similar.

Two questions arise thereupon. 1. Have the present forms of life existed from the beginning of the cooling of the Earth's crust down to the temperature known to be now compatible with organic life on the Earth? 2. If not, what process of formation has been gone through by each individual in its life-history and inheritance viewed as a whole? The first question has been answered by Palæontologists; the second is undergoing the most searching investigations by Physiologists. The general answer to the first is, that some forms have apparently existed unaltered for many hundred thousands of years; that great numbers of forms have come into existence, and great numbers have ceased to exist; and that there has been a general progress from the earliest dawn of life on the Earth until now, progress being reckoned by the development of Intelligence; that is, by an increasing supremacy of Mind over Matter. These two questions, as is known to the least instructed, have been the subject of active discussion for the last twenty years, chiefly through the writings of Mr. Darwin. Every year adds more and more facts towards their solution. The present attitude of the second question is the outcome of improvements in the mode of Microscopic Research in the last forty years, and especially in the last twenty. The answer to the second question is incomplete. It cannot be completed for many years to come. The Continent of America will, it may be said with certainty, produce new evidence of the mode of development of Species in Time. Minute Embryological research is only now beginning to put the whole problem of individual growth and formation into a complete form. On this last aspect of the subject it is expedient here to say something.

There are existing several hundred thousand species of animals, and at least an equal number of plants, each recorded and described under intelligible characters and by definite names. All have originated by off-shoots from individuals more or less like to themselves. In their growth, from their early individual life to their complete form, all the higher and more complicated kinds passed through several stages more or less similar to those which were permanent in

lower and less complicated forms. Hence it is often erroneously stated that each higher animal, such as a Mammal, actually had the form of a much lower, such as a Fish, at one stage of its existence. This carries the statement too far. The Embryo, or parts of the Embryo of a Higher Animal, pass through stages in growth which are not unlike the condition and form of a Lower Animal; but they are not identical, because among other notable reasons the Higher Animal at each stage of its existence contained the invisible and inexplicable potential properties of its own further individual development. On the theory of Evolution of all higher organisms from lower, the lower had necessarily this potentiality of all its subsequent development in Time, just as the yolk of a Fowl's Egg has of its future organs and of the complete Bird. Of the full significance of this potentiality in a scientific sense we can at present form no conception.

Nevertheless, a certain generalization, though on imperfect knowledge, has been arrived at. The "*omne vivum ex ovo*" of Harvey, if not universally true, is so generally true as to express fairly the starting-point of the large proportion of living beings. The tracing up the germ of all living structures, and comparing their growth one with another at every stage, constitutes Modern Comparative Embryology. The foundations of this vast and difficult science, as it now exists, have been laid within the memory of many of us. They have been attainable through the great improvements in the manner of making microscopic sections, and by the facilities of observation in aquaria. Through these several agencies, by the thousands of observers in Europe and America, and the activity of the better kind of periodicals, the relations of embryonic stages in typical species to allied or remote genera, and to extinct forms, as they are being unveiled to us, seem to be looming into view. At the same time, it must be acknowledged that various prejudices, some of them much to be respected, have hindered men from accepting some statements which demand acceptance, and have induced them to make other statements, which calmer judgments would have avoided.

At this point it may be properly observed that the phenomena of growth in the early embryo of an animal cannot be counted as a whit less marvellous, or at present less transcending our powers of conception, than the molecular changes in the infinite ether or the nebulous matter diffused through the universe which was spoken of at the outset.

The principle of growth, omitting many details, each of

which is probably of essential importance, is as follows: A compound cell, specially organized and prepared, containing millions of molecules, undergoes segmentation; *i.e.* division into two—each half carries off the half of a central nucleus. This group repeats itself till 4, 8, 16, 32, 64, and so forth, are similarly formed, coming at length to numbers which prevent the process from being further observed. The process itself has many modifications when pursued through the animal series, though the general principle is the same. The whole of the ovum may be equally divided or partially; this having relation to the amount of food-yolk contained, so that there is said to be equal segmentation, or unequal segmentation, or superficial segmentation. The innumerable offspring-cells of the original process henceforward pursue a complicated course of self-arrangement. This proceeds along certain broad lines of demarcation, grouping the future animals into great classes, and culminating in the marking out and definite formation of the textures and organs, of which the adult is to be the possessor, and which have been potentially contained in the germ.

And now if this rude sketch has been followed, it has to be remembered that we can only conceive that the millions of molecules which are contained in each of these organic germs are each endowed with the properties of inorganic matter before hinted at, and with certain peculiarities of whose essential nature we know absolutely nothing, but that they pertain to organic beings. And further, that it is only familiarity which can make us forgetful of the obvious truism that every common egg which we see or know of, whether of the fowl or of the meanest insect, in any one of the infinite number of individuals of the animal world which are springing into existence by millions at each moment of time, is as marvellous and inconceivable by us as the whole planetary system astronomically considered. The egg contains potentially the material frame, with all its marvellous mechanical adjustments, belonging to the species of which its adult is an example. It has moreover the power of transmitting this same material organization to successive generations in inconceivable numbers for unknown time; and it has, potentially, stored up within itself its animal wants, its instincts and its passions; its character, its emotions, and its mental attributes; and its free power of action.

Of all the marvels perhaps the greatest is, that it preserves the even tenor of its way obedient to certain tendencies; and yet that it is liable to be swayed by a mysterious relation to

other organisms to which it has been linked through unknown ages by some common bond.

In this direction our knowledge has been increased and classified of late years by Sars, Rathke, Von Baer, Martin Barry, and more lately by Parker and Balfour, to that extent that few can follow it. None who do not can conceive either the intricacy, the marvel, or the beauty. The intricacy—for it is manifest there are principles of unity which bind things most dissimilar through the almost infinite diversity of arrangement and form of living things; the marvel—for unexpected adaptations, unforeseen laws, spring up into view whenever the great storehouse is opened by patience and skill to human gaze; beauty—for the delicacy of texture and of form of these microscopic growths ravish the sight, as do the golden stars set in the blue depths of the stillest night. The rare industry and devotion of Professor Parker have made an epoch indeed in minute anatomical research into the history of animal growth.

One only hint remains to be given as to this second illustration of the aims and enquiries of modern science; viz., that *Disorder* would seem to be almost an essential incident to this amazing mass of order, and to this scheme of things; and that the disorder being an incident of the scheme itself, itself obeys a rule and has its bounds and its laws. These laws are in themselves complicated, and perhaps dependent partly on the circumstance of unceasing *change*, in the arrangement of Matter, of which illustrations have been given; and partly on the various relations of inheritance and fitness which organic beings have one to the other and the world external to them. Of this disorder the third instance furnishes an illustration which will now be described.

The third instance of modern scientific investigation then has relation to *Dis-order*. There is a whole class of diseases called zymotic, from the theory that they depend on a Fermentative change. The nature of the Ferment in certain diseases has been the subject of many enquiries. One of these is selected as an illustration of such.

It has been long known that the growth of a plant called the Yeast Plant, *Torula cerevisi*, is the cause of Fermentation in saccharine fluids, bringing about the formation of Alcohol and of Carbonic Acid. It is believed by many persons of authority that the putrefaction or fermentation which takes place in Blood is caused by the multiplication of minute living organisms—Bacteria—and not by a mere chemical change brought about by non-living substances. It was

desirable to ascertain the truth or untruth of this belief, from its bearing on the treatment of wounds and the management of surgical operations. Professor Lister, famous for his discoveries in Antiseptic Surgery, determined to solve this problem. He therefore studied with great care the fermentation of *Milk*. He found that there was a special form of Bacterium which belongs only to milk, and that this Bacterium, when it is present, keeps at bay all other organisms of the kind. Where it is absent other Bacteria flourish and produce a result analogous, but not exactly the same. Good fresh milk has not originally, in it, these "Bacteria Lactis." If the Bacterium Lactis be added to it, the souring of the milk is the immediate result. If kept from it, the milk remains fresh for many weeks. Professor Lister devised methods for isolating the Bacterium Lactis. He was able to experiment on exactly the $\frac{1}{10}$ of a minim or drop, to count the number of Bacteria in that $\frac{1}{10}$ minim, and then by diluting it with one million parts of boiled distilled water, he obtained an average of one bacterium to each minim of the diluted mixture. With this strength of the ferment (if it may be so called) he could measure its exact effect upon the milk. He discovered that the curdling of the milk took place with rapidity proportioned to the strength of the applied ferment; that is, to the number of Bacteria; that when there was no Bacterium there was no curdling, no other growths of "mould" appeared. The curdling or ferment of milk depends therefore upon a definite, observable, and attainable, but rare organism, which, moreover, can be kept out of the milk. It may indeed, says Mr. Lister, "seem strange that the ferment that leads to the souring of milk should be rare, but such is the fact; in dairies it appears to be universal, but in the world at large it is scarce."* Full-sized specimens measure about $\frac{1}{100000}$ of an inch.

The papers in which Mr. Lister details the steps by which these conclusions have been reached are well worth perusal, as illustrating by what careful measures such results are obtained. In this case they are well worth the skill and the labour; for it may be taken as almost proved, that the souring of milk is produced by one minute and almost invisible organism. The inference is, that it is a fact, and not an hypothesis, that analogous organisms produce analogous fermentation or putrefaction in other organic fluids and in wounds. The conclusion is, that operations which by putrefaction and foulness of the wound may be, and constantly

* *Transactions of the Pathological Society of London*, vol. xxix. 1878.

are, fatal, can with appropriate care become manageable and safe; not in one instance, nor in many, but always, and for the whole Human Race.

Of a similar, but of a yet more immediately practical kind, is an investigation now being carried on by Professor Rolleston, at Oxford, at the instance latterly of the Royal Agricultural Society, to determine the cause and mode of prevention of the "Rot" in sheep. As is well known, this depends on the ravages of an Entozoon. The study of the Natural History of Entozoa has become as extensive as fertile in result. Most animals are infested by some parasites. But some parasites require more than one kind of animal to bring them to maturity. The *ova*, for instance, of the tape-worm, to become completely mature in man, have to pass through another vertebrate, usually the pig. And according to the enquiries on which Professor Rolleston and Mr. Thomas are engaged, the parasite which kills the sheep has probably to pass through the common snail or the slug. In this case, if the snails can be destroyed, the sheep are saved.

This is a yet further and more complex instance than Lister's of the practical value and far-reaching result of purely scientific Biological investigation, since it promises in the end to be of vast importance to the food of man. The third instance may, when taken in connection with the previous instances, suggest some reflections, that cannot be now pursued, as to the ultimate nature of organic matter—its minuteness, its uniformity—and as to the definiteness and complexity of its laws. It gives an explanation of much that we have already believed to be true of the character of certain animal poisons. It shows the reality of some of our unseen enemies, and of the forces of destruction which surround us. It gives new hope of preventing much evil, which when existing we cannot cure. It helps to explain one of the many ways in which the long existing practice of Medicine is being strengthened by Scientific research into the constitution of things—research that the ignorant too often assume to be barren of practical result, and therefore to be of little value to Man. But the world is learning that any addition to Truth, as Truth, is itself of the highest value; not only as Truth, but because it is in the end the surest way of quickly winning practical good. The history of modern times is full of instances of this kind, as in Photography, the use of Chloroform, and Telegraphy.

To describe the methods and temper in which the organization of the pursuit of Physical Science is to be undertaken

would occupy far more time than is at our disposal. These have indeed been the subject of some of the highest efforts of human thought. Aristotle and Bacon, notwithstanding their respective errors and shortcomings—without mentioning enquirers of more recent times, who had access to far more material knowledge than their predecessors—made their memory great by their instruction in the way of handling the problem of the Material Universe more perhaps than by any other of their enquiries. Here it is enough to say that Physical Science, as I have shown it by the examples above given, seems to deal chiefly with the nature and order of material things, from the infinitely great in space and time to the infinitely little in both. It seeks the causes of all things which it can handle, can measure, can weigh, can examine. It scans alike the chemistry of the Sun, and the operation of the invisible imponderable particle. It asks the laws of insentient matter. It pierces to the beginnings of life, whether in the growth of the individual, or in the evolution of the globe. It traces each up to its maturity as far as each is mature. Indeed, it calculates in many directions the problem of the Future from the laws of the Past. Falteringly too, though sometimes too presumptuously, it strives to connect the mind of man with the matter of which his frame is composed, and so seeks to place the spirit that can only be discussed in *Literature* in the Crucible of the Chemist or in the Balance of the Physiologist. For the essence of Literature, which we have to consider in its relation to Science, is, that it is the record of the Nature of Man as truly Man. His struggles to free himself from the lower parts of his material organization are its special object, and its highest theme. It is permitted to indulge in a certain freedom, the offspring of Faith. It claims a play of imagination, which is denied to the rigid accuracy required for the data of Physical Science, and to the stern logic which at every stage is indispensable for any safe step in its advancement.

It may seem presumptuous to attempt a brief definition of Literature, and it is hopeless now to describe it at length. A few words only may be allowed in stating the characteristics of its present relation to Science on one hand and to Art on the other. It was said by no mean authority—the late Bishop Thirlwall—that there is an antagonism in modern times between Science and Literature—an antagonism depending on mutual distrust. If this be true, the reason is plain. Literature in its confessedly highest flights rests more on the imagination than Science can allow to be safe for correct

conclusion. To which Literature may give answer, that Science has often laid claim to an infallible Logic when its data did not warrant the trust imposed upon them. Two instances from a single modern English poet may serve better than any words of mine to put this point in a clear light.

"Behold her, single in the field,
Yon solitary Highland Lass!
Reaping and singing by herself;
Stop here, or gently pass!
Alone she cuts, and binds the grain,
And sings a melancholy strain;
O listen! for the Vale profound
Is overflowing with the sound.

"No Nightingale did ever chant
So sweetly to reposing bands
Of Travellers in some shady haunt,
Among Arabian Sands:
A voice so thrilling ne'er was heard
In spring-time from the Cuckoo-bird,
Breaking the silence of the seas
Among the farthest Hebrides.

"Will no one tell me what she sings?
Perhaps the plaintive numbers flow
For old, unhappy, far-off things,
And battles long ago:
Or is it some more humble lay,
Familiar matter of to-day?
Some natural sorrow, loss, or pain,
That has been, and may be again!

"Whate'er the theme, the Maiden sang
As if her song could have no ending;
I saw her singing at her work,
And o'er the sickle bending;—
I listened till I had my fill,
And when I mounted up the hill,
The music in my heart I bore,
Long after it was heard no more."

Sweet is the scene which the minstrel brings, telling of the peaceful joys of a Rural Home! Who does not see the sunlight and the wavy corn, and hear the music of a simple heart beating timely to its human affections? Who does not feel the glow reflected in his own breast when he remembers the picture indelibly stamped upon him,—the joys and the sorrows of an innocent and simple life, the scene, the singer, the melody, the poet who has lifted him away from his daily cares? And then listen to the lofty strains as the same Bard reaches forth to tell of the highest destiny of Man, and to paint for you his vision of enjoyed eternity, his hope of realised immortality.

"O joy, that in our embers
 Is something that doth live,
 That Nature yet remembers
 What was so fugitive !
 The thought of our past years in me doth breed
 Perpetual benediction : not indeed
 For that which is most worthy to be blessed ;
 Delight and liberty, the simple creed
 Of childhood, whether busy or at rest,
 With new-fledged hope still fluttering in his breast :—
 Not for these I raise
 The song of thanks and praise ;
 But for those obstinate questionings
 Of sense and outward things,
 Fallings from us, vanishings ;
 Blank misgivings of a Creature
 Moving about in worlds not realized,
 High instincts before which our mortal Nature
 Did tremble like a guilty thing surprised :
 But for those first affections,
 Those shadowy recollections,
 Which, be they what they may,
 Are yet the fountain light of all our day,
 Are yet a master light of all our seeing ;
 Uphold us, cherish, and have power to make
 Our noisy years seem moments in the being
 Of the eternal Silence : truths that wake,
 To perish never ;
 Which neither listlessness, nor mad endeavour,
 Nor Man nor Boy,
 Nor all that is at enmity with joy,
 Can utterly abolish or destroy !
 Hence, in a season of calm weather,
 Though inland far we be,
 Our souls have sight of that immortal sea
 Which brought us hither,
 Can in a moment travel thither,
 And see the children sport upon the shore,
 And hear the mighty waters rolling evermore."

"And O, ye Fountains, Meadows, Hills, and Groves,
 Think not of any severing of our loves !
 Yet in my heart of hearts I feel your might ;
 I only have relinquished one delight
 To live beneath your more habitual sway.
 I love the Brooks which down their channels fret,
 Even more than when I tripped lightly as they ;
 The innocent brightness of a new-born Day
 Is lovely yet ;
 The Clouds that gather round the setting sun
 Do take a sober colouring from an eye
 That hath kept watch o'er man's mortality ;
 Another race hath been and other palms are won.
 Thanks to the human heart by which we live,
 Thanks to its tenderness, its joys, and fears,
 To me the meanest flower that blows can give
 Thoughts that do often lie too deep for tears."

Between these two aspects of human life how manifold is the history! How wide apart the simple tale of individual innocence, and the prospect to the human race of awakened intellect and perfected goodness, varying in power, through infinite time, infinite knowledge, infinite immeasurable joys!

How unlike these thoughts are to the rigid conclusions of the Mathematician and the Scientist it is not needful to spend time in describing. The essence of Physical Science being the collection of Fact and the deduction of Law in the Material Universe, there is almost an aversion in its votaries, as such, to the baseless imaginings, as it seems to them, of human interest and the human heart. On the other hand, to the Moralist and Theologian such material enquiries are counted as dross in comparison with the aims and the discipline of the human Soul. This mutual repulsion did not always exist, nor has it existed even in later days in the greatest minds. Aristotle and Galen among the ancients, Bishop Butler almost in our own day, testify to the contrary. Nor need we hesitate to name Galileo, Newton, Herschel, Faraday, and hosts of others to whose temper the highest aims of Literature and the keenest search into material truth were alike congenial.

Hegel and the Hegelians have inflicted in later times grievous injury on the harmonious investigation into truth viewed as a whole. By advocating methods independent of experiment, and by claiming for subjective reason a higher place than for patient objective research, they provoked and received a Nemesis of retaliation and of prejudice harmful alike to themselves and to physical enquirers. The history of Science teaches that not unfrequently an excessive reliance on the evidence from Final Causes has done a similar though perhaps not so deep a mischief to the cause of the comprehensive study of Nature.

The Aims of Literature do not differ from those of Physical Science as much as do the Methods. It was well said by G. H. Lewes, "A Theory may be transferred from Metaphysics to Science, or from Science to Metaphysics, simply by the addition or the withdrawal of its verifiable element." "Thus the law of Universal Attraction becomes pure Metaphysics if we withdraw from it the verifiable specification of its mode of operation. *Withdraw* the formula, 'inversely as the square of the distance and directly as the mass,' and Attraction is left as a mere 'occult quality.'"^{*} It is therefore a confusion between the "Method" and the "Aim" which causes the

* *Aristotle*. By G. H. Lewes, p. 84.

feud, if feud there be, between Science and Literature. Both Science and Literature deal with *facts* and with *ideas*; if either seeks to use exclusively one branch of the arms, which should be used in their proper proportion during the onslaught they both wage on error or on ignorance, they must in some measure fail of success.

It may seem perhaps that in these statements a confusion is made between Literature and Metaphysic. The essence of Literature, it has been already said, is the dealing with matters of Human Interest. The vehicle of Literature is Language. The Language has to be employed in conformity with rules attained partly by experience—as it would seem empirically acquired—partly by intrinsic organic laws, partly by the culture and skill of experts, such as is acquired by experts in any Art, partly by the special inborn Gift of Style. The skill so attained is to be used in a form agreeable to the best aims of a pure nature. Thoughts for children, are expressed so as to meet the best instincts or emotions of the child, according to its race, inheritance, and surroundings; thoughts for women, so as to touch the tender chords of the purest and most unselfish love; thoughts for men, so as to nerve the impulses of patriotism and bravery; thoughts for all, so as to evoke those instincts of strife against all Evil, and those yearnings for the good and the noble, which are by a Hidden First Cause implanted indelibly in the Human Heart.

This Language so employed is expressed either in Prose or in Verse; Prose being Language employed in all cases where either narrative, history, description, or any subject-matter proper to Literature is needed. It rises at times to that kind of culture and elaborateness which emulates the musical cadence of Verse. Verse relinquishes the freer and less measured speech, and binds itself in certain chains of Form. It claims the right to the highest flights of imagination, to the hopes and fears of mortal man in his yearning for immortality, and his reaching up to the Infinite Good and the Personal Father of all. If the first attempt at Science by the Classification of Knowledge was, though with inadequate and even with erroneous *method*, made by the dwellers in Greece, so also unquestionably (if we except the lofty strains that sprung up from the Seers and Psalmists of Palestine) was the foundation laid of the purest and most perfect forms of Literature, Poetry and Prose, beneath the hills that stand round about the Acropolis of Athens, and among the dark olive groves that are washed by the pleasant rills of Ilissus

and Cephisus. But the precious gift of cultured speech belongs to no period and to no race. Eloquence is a gift of the Heart. It will burst forth with the gesture of the Savage, the stern thoughts of the Philosopher, or the violence of the Patriot, and then, when committed to writing, it becomes part of the prose Literature of the people. Facts which would be related for a scientific purpose in precise, perhaps bald terms, may become eloquent and poetical in the highest degree when represented by a great Master of Language and expression. Witness the following :

“Stand upon the peak of some isolated mountain at daybreak, when the night mists first rise from off the plains, and watch their white and lake-like fields as they float in level bays and winding gulfs about the islanded summits of the lower hills, untouched yet by more than dawn, colder and more quiet than a windless sea under the moon of midnight; watch when the first sunbeam is sent upon the silver channels, how the foam of their undulating surface parts and passes away; and down under their depths, the glittering city and green pasture lie like Atlantis, between the white paths of winding rivers; the flakes of light falling every moment faster and broader among the starry spires, as the wreathed surges break and vanish above them, and the confused crests and ridges of the dark hills shorten their grey shadows upon the plain. Wait a little longer, and you shall see those scattered mists rallying in the ravines, and floating up towards you, along the winding valleys, till they couch in quiet masses, iridescent with the morning light, upon the broad breasts of the higher hills, whose leagues of massy undulation will melt back and back into that robe of material light, until they fade away, lost in its lustre, to appear again above, in the serene heaven, like a wild, bright, impossible dream, foundationless and inaccessible, their very bases vanishing in the unsubstantial and mocking blue of the deep lake below. Wait yet a little longer, and you shall see those mists gather themselves into white towers, and stand like fortresses along the promontories, massy and motionless, only piled with every instant higher and higher into the sky, and casting longer shadows athwart the rocks; and out of the pale blue of the horizon you will see forming and advancing a troop of narrow, dark, pointed vapours, which will cover the sky, inch by inch, with their grey network, and take the light off the landscape with an eclipse which will stop the singing of the birds and the motion of the leaves together; and then you will see horizontal bars of black shadow forming under them, and lurid wreaths create themselves, you know not how, along the shoulders of the hills; you never see them form, but when you look back to a place which was clear an instant ago, there is a cloud on it, hanging by the precipices, as a hawk pauses over his prey. And then you will hear the sudden rush of the awakened wind, and you will see those

watch-towers of vapour swept away from their foundations, and waving curtains of opaque rain let down to the valleys, swinging from the burdened clouds in black, bending fringes, or pacing in pale columns along the lake level, grazing its surface into foam as they go. And then, as the sun sinks, you shall see the storm drift for an instant from off the hills, leaving their broad sides smoking, and loaded yet with snow-white, torn, steam-like rags of capricious vapour, now gone, now gathered again ; while the smouldering sun, seeming not far away, but burning like a red-hot ball beside you, and as if you could reach it, plunges through the rushing wind and rolling cloud with headlong fall, as if it meant to rise no more, dying all the air about it with blood. And then you shall hear the fainting tempest die in the hollow of the night, and you shall see a green halo kindling on the summit of the eastern hills, brighter—brighter yet, till the large white circle of the slow moon is lifted up among the barred clouds, step by step, line by line ; star after star she quenches with her kindling light, setting in their stead an army of pale, penetrable, fleecy wreaths in the heaven, to give light upon the earth, which move together, hand in hand, company by company, troop by troop, so measured in their unity of motion that the whole heaven seems to roll with them, and the earth to reel under them. And then wait yet for one hour, until the East again becomes purple, and the heaving mountains, rolling against it in darkness, like waves of a wild sea, are drowned one by one in the glory of its burning ; watch the white glaciers blaze in their winding paths about the mountains, like mighty serpents with scales of fire ; watch the columnar peaks of solitary snow, kindling downwards, chasm by chasm, each in itself a new morning ; their long avalanches cast down in keen streams brighter than the lightning, sending each his tribute of driven snow, like altar-smoke, up to the heaven ; the rose-light of their silent domes flushing that heaven about them and above them, piercing with purer light through its purple lines of lifted cloud, casting a new glory on every wreath as it passes by, until the whole heaven—one scarlet canopy—is interwoven with a roof of waving flame, and tossing, vault beyond vault, as with the drifted wings of many companies of angels ; and then, when you can look no more for gladness, and when you are bowed down with fear and love of the Maker and Doer of this, tell me who has best delivered this His message unto men."

This splendid description from Mr. Ruskin of certain natural phenomena, following the account given above of the "Universe of Stars," will recall to many minds the well-known lines—

"Thou Sun, of this great World both eye and soul,
Acknowledge him thy greater ; sound his praise
In thy eternal course, both when thou climb'st,
And when high noon hast gained, and when thou fall'st.

Moon, that now meet'st the orient Sun, now fliest,
 With the fixed Stars, fixed in their orb that flies ;
 And ye five other wandering Fires, that move
 In mystic dance, not without song, resound
 His praise who out of Darkness called up Light.
 Air, and ye Elements, the eldest birth
 Of Nature's womb, that in quaternion run
 Perpetual circle, multiform, and mix
 And nourish all things, let your ceaseless change
 Vary to our great Maker still new praise.
 Ye Mists and Exhalations, that now rise
 From hill or steaming lake, dusky or gray,
 Till the sun paint your fleecy skirts with gold,
 In honour to the World's great Author rise ;
 Whether to deck with clouds the uncoloured sky,
 Or wet the thirsty earth with falling showers,
 Rising or falling, still advance his praise.
 His praise, ye Winds, that from four quarters blow,
 Breathe soft or loud ; and wave your tops, ye Pines,
 With every Plant, in sign of worship wave.
 Fountains and ye, that warble, as ye flow,
 Melodious murmurs, warbling tune his praise.
 Join voices, all ye living Souls. Ye Birds,
 That singing up to Heaven-gate ascend,
 Bear on your wings and in your notes his praise.
 Ye that in waters glide, and ye that walk
 The earth, and stately tread, or lowly creep,
 Witness if I be silent, morn or even,
 To hill or valley, fountain, or fresh shade,
 Made vocal by my song, and taught his praise.
 Hail, universal Lord ! Be bounteous still
 To give us only good ; and, if the night
 Have gathered aught of evil, or concealed,
 Disperse it, as now light dispels the dark."

Thus Ruskin in prose, and Milton in lofty verse, handle
 the contemplation of Natural objects. Heber dashes a sad-
 dening touch of Scientific prophecy into similar poetic
 enthusiasm for Nature.

"I praised the Earth, in beauty seen
 With garlands gay of various green ;
 I praised the Sea, whose ample field
 Shone glorious as a silver shield ;
 And Earth and Ocean seemed to say,
 'Our beauties are but for a day !'

"I praised the Sun, whose chariot rolled
 On wheels of amber and of gold ;
 I praised the moon, whose softer eye
 Gleamed sweetly through the summer sky ;
 And Moon and Sun in answer said,
 'Our days of light are numbered !'"

Lastly, as all observations and collections of Fact cannot
 claim to be classed as Science, but only such as have been
 arranged, co-ordinated, classified, in relation to fundamental
 principles or laws, so a great portion of recorded knowledge,

however valuable, is excluded by common consent from the special term of Literature or Belles Lettres. Technical treatises of every kind are excluded; yet we often speak, and rightly, of the Literature of Science and of Art. In other words, writing that is purely narrative and technical, in every department of human knowledge, may often be, and is in the present day, wrought with so much skill, and is as a work of Art so pleasure-giving, that often the meanest subjects justly claim praise as expressed with literary sentiment and skill. The so-called Periodical Literature has become so powerful and so voluminous that, without it, progress, especially in Physical Science, is impossible to the student. The thousands of treatises which deal every year with new points of knowledge, and which appear in Transactions and Serials, have made Indices and Subject Catalogues as necessary for men of Letters and of Science as Highways have been to Commerce.

Since therefore Literature includes the record of all Moral and Subjective knowledge, and Physical Science includes all material and objective truth, they must not be held to be antagonistic one to the other, or in subjection one to the other, but as veritable sisters jointly occupied in promoting the common work of human progress—progress that would be without this union as incomplete as if an attempt were made with a warpless woof to weave a complex web.

Notwithstanding the admitted danger of Analogies, ART may be compared in its relation to Science and Literature with the Colour which gladdens the complex pattern, when woof and warp are deftly intertwined.

ART is the expression of the yearning after Beauty in design and in execution of every work of Man. Art is unwritten language. It has been graven in every country, under every sun, in every time, by every race. It employs material of Wood and of Metal, of Ivory and of Stone, of Pottery and of Parchment. It has given more than life to the cold marble of Pentelicus. It has fixed on panel and on canvas the light of the Sun, and the prism from the Rainbow. It is impressed on Jewels of the mine, and on colossal Sandstones in Egyptian deserts. The unlettered Eastern plays with it in matchless combinations of colour which the self-satisfied Western seems doomed to destroy. It has impressed every attribute of delicacy and of force on every substance through which the temper of man may be expressed, from the rudeness and brutality of the Savage to the playfulness of the Comic and the rage of the Tragic Muse. Setting forth,

as does Literature, the loftiest aspirations which language can fix of our better nature, ART has left to instructed and wondering generations the thoughts of Phidias and his fellows, telling of the inner sense of religious patriotism which stirred the heart of the cultured Greek. By the recorded pathos of Fra Angelico and Francia, by the delicacy of Lionardo and of Raphael, by the brilliancy of Giorgione and of Titian, by the force of Signorelli and Michael Angiolo, by the individualization of Holbein and Reynolds, the naturalistic splendour of Memling and Van Eyck, Art has fixed, in touches yet more indelible than words, the yearning of man's holier nature after that godliness, which is revealed by the true followers of the Son of Man; and it has placed for ever before us, in scenes of sadness and of peace, the Passion and precious Sacrifice of the Son of Man Himself.

Art is, generally speaking, in its essence either purely Imitative or Creative. It may therefore be Imitative of the meanest, or Creative of the bravest, the purest, and the most lovely. It may be employed on Still Life, on external Nature, on Human Interests, on the noblest and most airy conceptions of Imagination or of Fancy. It can do therefore what Science does not attempt, and ranges parallel to, and in some way beyond, the best and completest efforts of Language and of Literature. There are thoughts of devotion and of love which words cannot express. There is no emotion which the brush and the chisel cannot record.

What the degradation of its lowest performances, what the full effect of its noblest efforts, there is no time now to consider. Art is neither Science nor Literature. She adds to them both what neither can alone attain. She dare not claim for her pure votaries what the precision of Science can give, and she inflicts a stern Nemesis on any that would surrender themselves wholly and arrogantly to her supposed entire service, giving them too often only a stone when they think they have obtained bread. But she cannot be banished without grievous harm, often great in proportion to the real excellence which men may have attained in the service of her two sisters. When divorced from Religion she herself falls into decay. "The utterance of her language," says Mr. Newton, "is feebler or more emphatic; its range of expression narrower or more varied, according to the character of the religion, and the genius of the race." And she is to be read therefore only by the light of the History of the people whose works are the object of study.

From the assumed definitions of Science, of Literature,

and of Art, and from the general illustrations of their nature, some elementary conception may be formed of them, either individually, or in their relation one to the other. It would seem that Science chiefly seeks to know the established order and evolution of the material Universe; that Literature deals mainly with the interests and history of Man as such; that Art has especially to discover the nature of beauty in the world of matter or of mind, and to record the yearnings of the Human Soul in its search. It is in this, and in a yet more mysterious sense, that the highest kind of Music, partly by Association, partly by actual effect of Emotion, partly by pure Intellectual Pleasure, has a place in the domain of the highest Art.

One branch of the work of Art; viz., Landscape painting, was described with much interest by your able President of last year, and need not now therefore be further alluded to. I cannot refrain from adverting to a recent article on the state and prospects of Art in England by a truly noble Artist, Mr. Watts, in which he speaks with pathetic force of the hopelessness of prosperity in true Art, unless the prosperity of the nation depends on high aim and nobleness in the people—a lesson urged by Mr. Ruskin for many years with a splendour of illustration and power of language which have made him the greatest Critic of Art that the English race, or perhaps any race, has hitherto produced.

While to reach any one of these departments of Human Energy is almost beyond the opportunities of the most fortunate, and the strength of the most powerful, yet to pursue any one exclusively is certain to distort, if not to dwarf the mind.

The Literary man and the Moralist may be blinded to the astonishing revelations of material power which has been unfolded by Physical Science, and to the evidence and proof of infinite Order, nay, even of Design, which is almost implied by the ascertained facts of the material world. The Scientist, by dwelling exclusively on the very facts which are the subject, first of observation, and then of test by experiment, may by virtue of the intensity of his gaze become insensible to the light of moral and religious evidence, to the charm and the instruction derived from the high sensibility to beauty of form and of colour, to the operations of the Human Mind through works of Art, and to the suggestions derived from the sublimity or from the fascination of simple external Nature when untouched and unexplained by the Analysis of Physical Science.

What remains therefore to be said on this head is, that no training is complete which does not give to us some insight, according to our powers, into the groundwork of Science, of Literature, and of Art, and does not provide a deeper knowledge of some chosen department in one or other of them. Such training indeed we find to have existed in most, if not in all, of the greatest masters in any one branch of human thought.

It were indeed well if it were possible to speak at length of the nature of this training in each. But time forbids.

A Devonshire man, of rare genius, beloved for his personal qualities by those who knew him, but cut off from many by reason of some of his speculations, writing of the aims and instrument of scientific thought, says, "The aim of scientific thought is to apply past experience to new circumstances; the instrument is an observed uniformity in the course of events." And he adds this suggestive remark, that "by the use of this instrument it gives us information transcending our experience; it enables us to infer things that we have not seen from things we have seen, and the evidence for the truth of that information depends on our supposing that the uniformity holds good beyond our experience." The limitation of our knowledge therefore, present and to come, is derived from our defective means of observation, of experience, and of reasoning. History shows us that each of these processes has been capable of improvement truly astonishing. The limits of improvement time alone can show.

And as to our means of training for the purpose of rightly dealing with human interests as distinguished from mere material fact, it has been said by one of the acutest of modern thinkers, in writing of the constitution of the intellect, that our means of progress depend on "the ability inherent in our Nature to appreciate Order, and the concurrent presumption however founded, that the phenomena of Nature are connected by a principle of Order." No one can look at the course of human affairs, nor scan their history, without feeling that the elements of disorder introduced by untruth into the world must be compatible with some Higher Order which allows the exercise of a free choice to responsible beings. There is in the world a terrible choice of falsehood, injustice, and sin. Moral order must tend to suppress them all. But we seek in vain for a solution of the difficulty solely in the conduct of intellectual Man, just as we fail to find it solely in the stern laws of the material world.

And if to the light which Science and Literature have

given to us we add the bright gleams which the Creations of Art have flashed upon us, regions of thought and hope and peace seem to rise up from afar, regions in which search may be merged in knowledge, and where we look for the highest conceivable joy in the presence of All Good. But such concepts belong to the domain of Faith, and the rules and usages of your Association properly require that these heights should not be scaled from here. In the words of Bacon, "*da Fidei quæ Fidei sunt.*"

I add but one remark, one which perhaps may have a special interest rather to the Physician than to those who in the full pride of life can scarcely dwell on the sufferings and sorrows of Man. The progress of Man lies in the just proportion in which his faculties are developed. The mental qualities which Science, which Metaphysic, which Art respectively evoke are each made more perfect when duly related to one another. And the physical power, the discipline, and care of the Body are not to be forgotten even in the reckoning up of the requirements for mental improvement. May we all seek so to promote the means and conditions of healthy life in every class and in every occupation, that we may omit nothing, in this age of unexampled struggle for existence, by which all pure Science, all useful Art, and all manly Culture, may have their fullest effect on the intellects and on the hearts of the masses of our people.

Obituary Notices.

COMPILED BY THE REV. W. HARPLEY, M.A., HON. SECRETARY OF THE ASSOCIATION.

(Read at Totnes, July, 1880.)

I.

FREDERICK ASH was for upwards of twenty years manager of the branch of the National Provincial Bank of England at Dartmouth, where, by his unfailing courtesy and kindness, he had made a wide circle of friends. In business habits he was strictly attentive and conscientious, always willing to do his utmost for the benefit of every one. Privately no one was more loving, kind, and affectionate. He was foremost in the promotion of all charitable objects. He held several offices of trust—he was an active member of the Regatta Committee, and treasurer to the Royal Dart Yacht Club.

He was elected a member of this Association in 1868, and in the following year was the Local Treasurer at the meeting at Dartmouth, the duties of which office he discharged in a most efficient manner. Early in life he devoted attention to geology, and made a large collection of fossils from the older Palæozoic rocks of Wales, including a very fine and valuable series of trilobites.

Mr. Ash had gone to London with his wife for the benefit of his health, which had not been very good for some little time, although no serious results were apprehended. Soon after his arrival at Parker's Hotel he died suddenly, on May 26th, 1880, aged 54 years.

II.

The Right Hon. Sir STEPHEN CAVE, G.C.B., was the eldest son of the late Mr. Daniel Cave, of Cleve Hill, near Bristol, and of Sidbury Manor, Devonshire. He was born in the

year 1820, and was educated at Harrow and at Baliol College, Oxford, where he took his Bachelor's degree in 1843, obtaining a second class in the school of *Literæ humaniores*. In 1846 he was called to the Bar of the Inner Temple, and for a short time went the Western Circuit. In 1859, on the death of Sir Charles Burrell, he was elected M.P. for Shoreham, and continued to represent that constituency in the Conservative interest down to April last.

He was sent on a special mission to Paris in 1866, and in the same year was appointed Paymaster-General and Vice-President of the Board of Trade; but this post he resigned with his party in 1869. In 1874 he was reappointed Paymaster-General, and in the winter of 1875-76 was sent to Egypt by Lord Beaconsfield as special envoy to report on the financial difficulties of that country. At the dissolution in March last he resigned his seat as member for Shoreham, and at the same time he was nominated a Knight Grand Cross of the Order of the Bath, Civil Division. He went down to Windsor to be invested with that honour, and many of his friends at the time feared he would not live long to enjoy it, as he had long been in failing health.

Sir Stephen Cave was a magistrate and deputy-lieutenant for Gloucestershire, a commissioner of lieutenancy for London, and president of the West India Committee; he also was at one time a director of the Bank of England and of the London Dock Company. He married, in 1852, Emma, daughter of the late Rev. William Smyth, of Elkington Hall, Lincolnshire, sometime prebendary of Lincoln Cathedral.

He joined the Association in 1873 as a Life Member, and was elected President the same year, and delivered an able address at the meeting at Sidmouth. The following year he filled the office of Vice-President. He died on Monday, June 7th, 1880, aged 59 years.

III.

JOHN HOW, J.P., of Woodville, near Bideford, was for many years head of the well-known firm of timber, coal, and manure merchants, trading under the style of "J. How and Co."

He took an active part in public affairs; he was twice mayor, and the chairman of the first School Board at Bideford. He was also a guardian of the poor, which office he held up to his decease. A few years before his death his health began to decline, and he was compelled to sever his connection with the Corporation and the School Board.

Mr. How joined the Association in 1871, and was elected one of the Vice-Presidents for that year, when, as Mayor of the borough, he gave a hearty reception to the members of the Association, and largely aided in securing the success of the meeting at Bideford.

In religion Mr. How was a Wesleyan. He died on Saturday, February 21st, 1880, at the comparatively early age of 57 years. The funeral was of a public character, and the procession was of great length, all his *employés* and servants, many of the tradesmen and other residents of the town, and farmers of the neighbourhood, being present. The bells of St. Mary's Church were tolled at intervals during the day, at the request of the rector, as a mark of esteem.

FIFTH REPORT OF THE COMMITTEE ON THE METEOROLOGY OF DEVONSHIRE.

FIFTH REPORT of the Committee—Mr. P. F. S. Amery, Mr. H. S. Gill, Mr. E. E. Glyde, Dr. W. C. Lake, Mr. E. Parfitt, Dr. W. T. Radford, and Mr. E. Vivian—for the purpose of making and obtaining observations on a uniform system on the Meteorology of Devonshire.

. Edited by W. C. LAKE, M.D., F.R.S., Honorary Secretary.

(Read at Totnes, July, 1890.)

IN presenting their fifth report to the Council of the Devonshire Association, the Committee for recording observations on the Meteorology of Devonshire have to regret the omission of observations from Princetown, Dartmoor, Mr. Power, the former observer there, having left that locality; but they are able to report observations taken at Woodway, Teignmouth, by Mr. G. W. Ormerod, in addition to those taken at Bitton, in that town.

The localities therefore stand as follows :

Height above Sea-level.	Name of Station.	Name of Observer.	Observations taken of			
			Baro- meter	Ther- mo- meter	Hu- midity	Rain- fall.
feet.						
650	Holne Vicarage, near Ashburton . .	Rev. J. Gill . .				+
570	Druid, Ashburton . .	F. Amery, Esq. . .		+	+	+
63	Kingsbridge . .	G. Fox, Esq. . .		+	+	+
400	Rocombe, Torquay . .	H. Hearder, Esq. . .		+	+	+
— 305	Babbicombe . .	E. Glyde, Esq. . .		+	+	+
* 50	Bitton, Teignmouth . .	Dr. Lake . .	+	+	+	+
235	Woodway, Teignmouth . .	G. W. Ormerod, Esq. .	+	+	+	+
190	Sidmouth, Sidmouth . .	Dr. Radford . .		+	+	+
140	Brampford Speke . .	W. H. Gamlen, Esq. .		+	+	+
230	Exe Villa, Tiverton . .	H. S. Gill, Esq. . .		+	+	+

* Cistern of Barometer 70 feet above sea-level.

These stations may be grouped as follows: Those on the sea-coast, varying in elevation from that at Bitton, Teignmouth, at 50 feet, to that at Rocombe, Torquay, at 400 feet above sea-level; one at Kingsbridge, distant four miles and a half from the sea; two on the borders of Dartmoor, and two in inland parts of the county, removed both from the sea and the moor.

The greatest interest in the comparison of these localities will probably be in that between the seaside localities, one with another, and in the comparison of these with the other stations in their varying relationships.

Of the seaside stations, Rocombe can only be considered to represent the highest part of Torquay; and both Rocombe and Babbicombe may be regarded as the most elevated portions of their locality.

Teignmouth, about the same distance from Dartmoor as Torquay, is perhaps more directly exposed to its influence through the Bovey Heathfield and the estuary of the Teign, whilst immediately behind it rises Haldon, to an elevation of 800 feet above the sea, nearly twice the height of the high land of Torquay. To the greater proximity of Woodway than of Bitton to Haldon, as well as to the difference of elevation, is probably owing the variation, in some points so marked, to be noticed between the two Teignmouth stations.

Sidmouth, again, must be completely removed from the influence of Dartmoor. The hills immediately behind it rise to the height of 500 feet above the sea.

Babbicombe is on a limestone soil, Rocombe on shale, the Teignmouth stations and Sidmouth on the red sandstone.

The main meteorological features of 1879 were its singular and persistent coldness and gloom, and its abundant rainfall; the last three months having, however, bright skies and deficient rainfall, but the cold of December being unusually severe.

The observations recorded from Holne Vicarage, it may be remarked, are only those of rainfall. The observations of temperature at Tiverton cease after June.

Taking then the seaside stations during the months of January, February, and March, the mean maximum shade temperature was highest for each of these months at the two Teignmouth stations; least high at Sidmouth. The mean minimum shade temperature was for each of these months highest at Bitton, Teignmouth, lowest at Woodway, Teignmouth; the difference between Bitton and the rest of these stations being less than that between Woodway and these.

As to humidity, at 9 a.m., Babbicombe and Bitton, for January, were drier than Rocombe, Torquay, and Woodway; for February and March, Bitton and Sidmouth were drier than the other three stations.

Comparing this group with the outside stations, the mean maximum temperature was higher for January at Kingsbridge than at either of the seaside stations; lower at Brampford Speke. Lower for February at Brampford Speke; higher for March at Kingsbridge. The mean minimum temperature was lower for March at Tiverton. The greatest humidity at 9 a.m. for any station, was for each month that at Druid, Ashburton.

During April, May, and June—

At the seaside stations the mean maximum temperature was highest for each month at the two Teignmouth stations, lowest at Sidmouth; but at Woodway it was much higher, both for May and June, than either at Bitton or the other stations. The mean minimum temperature was for each month highest at Bitton, lowest at Woodway. The air at 9 a.m. was, for April, driest at Bitton; least dry at Woodway and Sidmouth. For May, drier at Bitton and Sidmouth than at the three other stations. For June, driest at Bitton; least dry at Woodway.

In regard to the outside stations, the mean minimum temperature was lower than at any seaside station, for April, at Brampford Speke and Tiverton; for May and June, at Tiverton. Humidity was greatest for each month at Druid.

During July, August, and September—

At the seaside stations the mean maximum temperature was highest for each month at Woodway; lowest at Sidmouth and Rocombe. The mean minimum temperature was highest for July and August at Bitton and Sidmouth, and for September at Bitton; lowest for each month at Woodway. The air at 9 a.m. was driest for each month at Bitton; least dry for July, at Woodway; for August, at Woodway and Rocombe; for September, at Woodway.

As to the outside stations, the mean maximum temperature was lower at Brampford Speke for September than at either of the seaside stations. The mean minimum temperature was somewhat higher than at either of these for August at Kingsbridge, and lower for September at Druid. Humidity was greatest for each month at Druid.

During October, November, and December—

At the seaside stations the mean maximum temperature was highest at both the Teignmouth stations for each month,

lowest at Sidmouth. The mean minimum temperature was highest for October at Bitton, lowest at Woodway; highest for November at Babbicombe and Bitton, lowest at Woodway; highest for December at Rocombe and Babbicombe, lowest at the two Teignmouth stations. The air at 9 a.m. was much drier for October at Bitton than at either of the four other stations, where the humidity was for each the same. It was drier for November at Babbicombe, least dry at Rocombe and Sidmouth. It was drier for December at Sidmouth, least dry at Rocombe and Babbicombe, the difference between the stations being however small.

As to the outside stations, the mean maximum temperature was lower at Brampford Speke than at either of the seaside stations for each of these months, the difference being large in November and December. The mean minimum temperature was higher than at any seaside station for October at Kingsbridge, somewhat lower at Brampford Speke; and it was lower also for November and December at Brampford Speke. Humidity was greatest for each month at Druid.

The observations for the year may be thus summarized:

The high day temperature was for the seaside stations, speaking generally, highest at Teignmouth, lowest at Sidmouth, this being more marked in the summer months, and during these months particularly as to high maximum temperature at Woodway, as to low maximum temperature at Sidmouth and Rocombe.

The low night temperature was, as a rule, highest at Bitton, lowest—sometimes much so—at Woodway, this element being usually closely approximate at Bitton and Babbicombe. In November it was, however, slightly higher at Babbicombe, and in December higher at Babbicombe, Rocombe, and Sidmouth, than at either of the Teignmouth stations.

The dryness of the air at 9 a.m. was, as a rule, greatest at Bitton, the air at Sidmouth being equally dry for February, March, and May; and the dryness for November being greatest at Babbicombe, and for December at Sidmouth.

At Kingsbridge the maximum day temperature was high through each month of the year except December, but it did not in summer equal that at Woodway. The minimum night temperature was also high during the year, though surpassed by some one or other of the seaside stations in January, March, April, July, September, November, and December.

Its degree of humidity held usually a mean place, but in August, September, and November, Kingsbridge ranked amongst the driest places.

Druid did not differ remarkably in temperature from the southern stations, but its most marked feature was its abundant humidity.

Brampford Speke, except during the summer months, exhibited a somewhat low day and night temperature; and

Tiverton, for the months during which observations were recorded, showed its usual characteristics of high day and low night temperatures.

The total rainfall for the various stations during the year was as follows :

NAME OF STATION.	Total Rainfall in Inches.	Total Number of Wet Days.	Greatest Fall in One Day in Inches.
Holne Vicarage	74.81	223	2.94
Druid, Ashburton	58.39	196	2.35
Kingsbridge	41.49	191	1.89
Rocombe, Torquay	36.30	191	1.27
Babbicombe	41.02	212	1.53
Bitton, Teignmouth	37.92	214	1.40
Woodway, Teignmouth	39.81	213	1.42
Sidmount, Sidmouth	37.65	193	...
Brampford Speke	36.30	220	0.90
Exe Villa, Tiverton	39.60	211	1.27

The greatest rainfall in each month was at Holne Vicarage, except during April and November, when the greatest rainfall was at Kingsbridge.

The least monthly rainfall was, for January and February, at Brampford Speke; for March, at Rocombe and Bitton; for April, at Tiverton; for May, at Rocombe; for June, at Brampford Speke; for July, at Bitton; for August, at Brampford Speke; for September, at Bitton; for October and November, at Rocombe, and for December, at Sidmouth.

The total rainfall for the year was greatest at Holne Vicarage, least at Rocombe, Torquay, and Brampford Speke.

The number of wet days for the year was greatest at Holne Vicarage, least at Kingsbridge and Rocombe.

The greatest fall in twenty-four hours for the year was 2.94 inches, at Holne Vicarage, which took place in the month of June.

(Signed) H. S. GILL, Chairman.
W. C. LAKE, M.D., Hon. Sec.

JANUARY, 1879.

NAME OF STATION.	WIND a.m.		THERMOMETER IN SHADE.						THERMOMETER IN BLACK BULB IN VAPOUR.		WIND a.m.								RAIK.	
	Mean Cor.	Wn. reduced to Sea-level.	THERMOMETER IN SHADE.						THERMOMETER IN BLACK BULB IN VAPOUR.		WIND a.m.								Number of Wet Days in one day.	Total in Month.
			Highest Maximum.	Lowest Minimum.	Mean of all.	Mean Bulb.	Mean Wet Bulb.	Mean Humidity.	Highest Maximum.	Lowest Minimum.	Mean of all.	North-east.	North-west.	South-east.	South-west.	West.	North-west.	Calm.		
Holne Vicarage	...	...	53.0	26.0	46.5	35.5	41.0	40.0	...	...	...	...	...	...	...	...	...	...	11.30	15
Druid, Ashburton	...	...	52.0	19.0	38.1	30.4	34.3	33.7	94	...	...	...	...	...	...	...	...	...	8.40	15
Kingsbridge	...	...	53.0	14.5	42.1	32.3	36.7	35.3	88	...	...	...	...	...	...	...	...	...	7.57	13
Rocombe, Torquay	...	...	51.7	19.5	39.4	31.9	35.5	34.1	87	98.1	54.5	14.7	28.3	6	8	3	2	...	5.41	14
Babbicombe	29.643	29.984	52.8	19.1	39.8	32.6	35.9	34.3	85	103.5	56.0	12.6	28.3	3	9	10	2	1	6.35	15
Biton, Teignmouth	29.967	29.994	54.0	18.8	40.8	32.8	36.2	34.6	85	108.0	58.1	15.0	28.6	2	8	6	5	...	5.72	10
Woodway, Teignmouth	29.922	...	55.0	19.0	40.8	29.7	30.1	35.3	93	101.7	56.8	11.7	27.1	...	...	...	...	...	6.02	16
Sidmouth, Sidmouth	...	...	51.8	20.0	38.3	31.7	...	...	...	101.0	...	12.5	...	...	...	...	...	...	4.48	11
Brampford Speke	...	...	48.0	15.0	37.2	30.4	...	...	...	...	...	...	...	...	...	...	...	...	4.44	14
Exe Villa, Tiverton	...	...	52.0	14.0	39.0	30.0	...	...	...	...	...	...	...	...	...	...	...	...	5.42	14

FEBRUARY, 1879.

Holne Vicarage	...	...	53.0	26.0	46.5	35.5	41.0	40.0	92	...	...	...	...	...	...	...	...	...	11.88	23
Druid, Ashburton	...	...	54.0	28.0	48.1	37.5	42.8	41.3	88	...	...	...	...	...	...	...	...	...	8.83	19
Kingsbridge	...	...	53.7	27.6	45.8	36.1	40.3	39.1	90	112.3	85.8	22.5	32.6	7	1	...	...	...	6.18	21
Rocombe, Torquay	...	...	53.7	27.6	45.8	36.1	40.3	39.1	90	112.3	85.8	22.5	32.6	7	1	...	...	...	6.18	21
Babbicombe	29.211	29.544	53.9	28.2	46.7	36.8	41.0	39.6	88	111.6	88.1	21.9	31.5	4	3	2	3	4	4.94	25
Biton, Teignmouth	29.526	29.545	56.1	27.1	48.2	36.9	41.8	39.9	86	109.0	88.4	19.5	32.3	4	1	2	3	4	5.49	25
Woodway, Teignmouth	29.410	29.483	55.3	24.3	48.2	34.5	41.7	40.6	91	105.0	88.2	22.2	32.0	4	1	2	1	5	5.36	27
Sidmouth, Sidmouth	...	...	53.0	27.5	44.9	36.5	...	...	86	101.6	...	21.5	...	...	...	...	...	...	5.37	26
Brampford Speke	...	...	53.0	27.0	44.8	36.5	...	...	...	...	...	...	...	...	...	...	...	...	5.51	22
Exe Villa, Tiverton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.53	24
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5.20	24

MARCH, 1879.

NAME OF STATION.	Nine a.m.		Thermometer in Shade.										Thermometer in Glass.		Nine a.m.								Rain.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Mean Cor.	Inches.	Thermometer in Shade.										Thermo. in Water or Glass.	Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Holne Vicarage	60.0	27.0	49.2	36.3	43.4	42.2	91</

APRIL, 1879.

Holne Vicarage	61.0	30.0	52.4	37.8	45.4	44.0	89	4.59	20	0.95
Druid, Ashburton	...	...	59.0	27.0	49.2	36.3	43.4	42.2	91	...	...	...	...	...	...	...	...	...	3.92	17	0.58
Kingsbridge	...	...	59.0	27.0	50.6	35.9	43.8	41.7	83	...	...	...	...	...	...	...	...	...	4.71	17	0.91
Recombe, Torquay	...	...	60.0	28.9	51.3	37.8	44.9	42.3	81	130.8	107.7	...	...	...	...	...	...	...	4.00	19	0.60
Babbicombe	29.349	29.680	57.9	30.8	51.1	38.3	45.4	42.7	81	127.4	107.3	...	...	...	...	...	...	...	4.16	21	0.65
Bitton, Teignmouth	29.516	29.593	58.9	31.2	52.1	38.8	46.3	43.2	78	119.6	104.8	...	...	...	...	...	...	...	4.01	22	0.75
Woodway, Teignmouth	...	29.604	60.4	28.3	53.2	36.3	47.1	44.6	82	123.3	106.9	...	...	...	...	...	...	...	4.11	21	0.71
Sidmouth, Sidmouth	...	...	56.0	30.0	49.3	37.8	...	...	...	...	...	...	...	...	...	...	...	...	4.24	15	...
Brampford Speke	...	...	59.0	29.0	48.1	35.1	...	...	...	...	...	...	...	...	...	...	...	...	3.66	21	0.61
Exe Villa, Tiverton	...	...	60.0	26.0	53.0	35.5	...	...	...	...	...	...	...	...	...	...	...	...	3.40	21	0.60

MAY, 1879.

NAME OF STATION.	Nine a.m. BAROMETER.		Nine a.m. THERMOMETER IN SHADE.										THERMOMETER IN SUN, SHADE, AND IN WIND.		Nine a.m. WIND.								RAINF.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Mean reduced.	In. reduced to Sea-level.	Thermometer.					Thermometer in Sun, Shade, and in Wind.					Thermometer in Sun, Shade, and in Wind.	Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
			Highest.	Maximum.	Lowest.	Minimum.	Mean of all.	Highest.	Maximum.	Lowest.	Minimum.	Mean of all.		North-east.	North-west.	East.	South-east.	South-west.	West.	North-west.	Calm.	Total in Month.		Number of Wet Days.	Greatest Fall in one day.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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JUNE, 1879.

Holne Vicarage</
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JULY, 1879.

NAME OF STATION.	Nine a.m. BAROMETER.		Nine a.m. THERMOMETER IN SHADE.										THERMOMETER IN SUN. Black Bulb in VACUO.		Nine a.m. WIND.								RAIZ.								
	Mean Cor.	Mr. reduced to Sea-level.	Inches.	Highest.	Lowest.	Maximum.	Minimum.	Mean of all.	Mean Dry.	Mean Wet.	Mean Bath.	Mean Humidity.	Highest.	Maximum.	Mean of all.	Lowest.	Minimum.	Mean of all.	Thermo. in Water or Glass.	North.	North-east.	South.	South-west.	West.	North-west.	Calm.	Total in Month.	Number of Wet Days.	Greatest Fall in one day.		
Holne Vicarage	...	...	...	71.0	48.0	63.8	51.4	56.6	55.6	93	...	...	...	...	...	...	...	...	...	...	2	2	2	1	10	7	5.13	24	2.09		
Druid, Ashburton	...	...	...	71.5	45.0	64.0	52.1	59.3	56.5	83	...	...	...	...	...	...	...	...	...	...	3	1	...	...	9	11	7	5.01	23	1.15	
Kingsbridge	...	...	...	70.1	48.0	62.1	51.7	55.6	53.2	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3.09	19	0.67	
Rocombe, Torquay	...	...	...	70.6	47.6	63.6	51.9	58.3	55.8	85	...	...	...	...	...	...	...	...	...	...	1	2	3	...	4	8	10	4	3.55	20	0.86
Babbicombe	29.520	29.844	...	72.6	49.1	64.5	52.3	58.1	55.3	82	...	...	...	...	...	...	...	...	...	...	1	1	2	1	14	7	2	1	3.01	20	0.71
Bitton, Teignmouth	29.696	29.772	...	74.2	46.0	66.7	50.1	59.4	57.5	88	...	...	...	...	...	...	...	...	...	...	1	1	2	1	14	7	2	1	3.01	20	0.71
Woodway, Teignmouth	29.644	29.783	...	69.5	48.5	62.0	52.1	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	1	3	5	12	...	...	3.32	23	0.72
Sidmouth, Sidmouth	...	...	...	73.0	47.0	63.0	52.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3.86	22	0.65
Brampford Speke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3.63	21	0.88
Ere Villa, Tiverton.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

AUGUST, 1879.

Holne Vicarage	...	...	...	71.0	46.0	65.1	53.3	59.4	57.3	89	...	...	...	...	...	...	...	...	...	...	8.64	25	1.55
Druid, Ashburton	...	...	...	72.0	38.0	65.2	55.7	60.5	57.7	83	...	...	...	...	...	...	...	...	...	...	6.87	23	1.50
Kingsbridge	...	...	...	69.0	48.0	63.9	53.9	59.1	57.0	87	...	...	...	...	...	...	...	...	...	...	7.04	25	1.62
Rocombe, Torquay	...	...	...	71.1	45.8	64.5	53.6	60.1	57.3	84	...	...	...	...	...	...	...	...	...	...	5.09	21	1.22
Babbicombe	29.528	29.851	...	70.9	47.6	64.0	53.2	60.3	57.3	82	...	...	...	...	...	...	...	...	...	...	5.49	23	1.32
Bitton, Teignmouth	29.766	29.842	...	74.7	44.3	66.8	51.9	61.3	59.1	87	...	...	...	...	...	...	...	...	...	...	4.81	24	1.09
Woodway, Teignmouth	29.653	29.772	...	70.0	45.0	63.6	55.6	...	...	...	...	...	...	...	...	...	...	...	...	...	4.93	24	1.10
Sidmouth, Sidmouth	...	...	...	72.0	42.0	64.0	54.0	...	...	...	...	...	...	...	...	...	...	...	...	...	5.42	22	...
Brampford Speke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.34	24	0.90
Ere Villa, Tiverton.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5.75	21	1.27

SEPTEMBER, 1879.

NAME OF STATION.	Nine a.m. Barometer.		Thermometer in Shade.										Thermometer in Sun. Black Ball in Vacuum.				Nine a.m. Wind.								Rain.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Mean Cor. rected.	Mr. reduced to Sea-level.	Highest.		Maximum.		Minimum.		Mean of all.		Mean Dry.		Mean Wet.		Mean Humidity.		Highest.		Mean of all.		Lowest.		Mean of all.		Thermo- meter on Grass.	North-east.	East.	South-east.	South.	South-west.	West.	North-west.	Calm.	Total in Month.	Number of Wet Days.	Greatest Fall in one day.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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OCTOBER, 1879.

Holne Vicarage
Druid, Ashburton
Kingsbridge
Rocombe, Torquay
Babbacombe	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bitton, Teignmouth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Woodway, Teignmouth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sidmouth, Sidmouth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Brampford Speke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Exe Villa, Tiverton.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

NOVEMBER, 1879.

NAME OF STATION.	Barometer.		Thermometer in Shade.						Thermometer in Sun.		Wind.								Rain.	
	Mean Cor.	Mn. reduced to Sea-level.	Nine a.m.						Black Bulb in Vapour.		Nine a.m.								Number of Wet Days.	Greatest Fall in one day.
			Highest.	Lowest.	Mean of all.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Humidity.	Highest.	Lowest.	Mean of all.	North.	North-east.	South.	South-west.	West.	North-west.	Calim.		
Holne Vicarage	52.0	22.0	43.4	28.2	38.0	37.0	91	...	...	...	...	...	...	...	...	...	5	0.11
Druid, Ashburton	54.0	18.0	41.8	30.8	37.4	36.1	89	...	...	...	...	...	...	...	...	...	6	0.25
Kingsbridge	51.7	23.7	42.9	32.7	36.9	35.7	89	...	...	...	...	...	...	...	...	...	4	0.80
Rocombe, Torquay	52.3	22.8	42.8	32.1	36.5	35.3	89	...	...	...	...	...	...	...	...	...	4	0.09
Babbicombe	54.1	23.5	44.3	30.3	35.8	34.5	88	...	...	...	...	...	...	...	...	...	6	0.12
Biton, Teignmouth	54.6	21.3	44.1	29.8	35.8	34.5	88	...	...	...	...	...	...	...	...	...	7	0.13
Woodway, Teignmouth	54.0	21.0	42.3	31.3	...	...	87	...	...	...	...	...	...	...	...	...	2	...
Sidmouth, Sidmouth	55.0	19.0	38.0	27.0	...	...	...	...	...	...	...	...	...	...	...	...	9	...
Brampford Speke	10	0.35
Exe Villa, Tiverton	19	0.55

DECEMBER, 1879.

Holne Vicarage	...	...	52.0	22.0	43.4	28.2	38.0	37.0	91	...	...	...	...	...	...	...	...	...	11	0.86
Druid, Ashburton	...	...	54.0	18.0	41.8	30.8	37.4	36.1	89	...	...	...	...	...	...	...	...	...	11	0.68
Kingsbridge	...	...	51.7	23.7	42.9	32.7	36.9	35.7	89	...	...	...	...	...	...	...	...	...	11	0.49
Rocombe, Torquay	...	...	52.3	22.8	42.8	32.1	36.5	35.3	89	...	...	...	...	...	...	...	...	...	14	0.33
Babbicombe	...	...	54.1	23.5	44.3	30.3	35.8	34.5	88	...	...	...	...	...	...	...	...	...	13	0.33
Biton, Teignmouth	...	...	54.6	21.3	44.1	29.8	35.8	34.5	88	...	...	...	...	...	...	...	...	...	13	0.22
Woodway, Teignmouth	...	...	54.0	21.0	42.3	31.3	...	...	87	...	...	...	...	...	...	...	...	...	2	0.90
Sidmouth, Sidmouth	...	...	55.0	19.0	38.0	27.0	...	...	...	...	...	...	...	...	...	...	...	...	10	0.35
Brampford Speke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	0.55
Exe Villa, Tiverton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	0.55

FIFTH REPORT OF THE COMMITTEE ON SCIENTIFIC MEMORANDA.

FIFTH REPORT of the Committee, consisting of Mr. G. Doe, Rev. W. Harpley, Mr. N. S. Heineken, Mr. H. S. Gill, Mr. E. Parfitt, Mr. W. Pengelly (Secretary), and Mr. J. Brooking Rowe, for the purpose of noting the discovery or occurrence of such facts, in any department of scientific inquiry, and connected with Devonshire, as it may be desirable to place on permanent record, but may not be of sufficient importance in themselves to form the subjects of separate papers.

Edited by W. PENGELLY, F.R.S., F.G.S., &c., Hon. Secretary of the Committee.

(Read at Totnes, July, 1880.)

THIS Report includes *Memoranda* of facts which have been discovered, or observed, or have become known to members of the Committee, during the twelve months ending 31st May, 1880.

Those portions of the Report not placed within inverted commas are editorial. The sources whence all the other portions have been derived are either fully stated, or are indicated by initials, the full import of which is as follows :

- | | |
|---------------|--|
| G. G. B. | = Rev. G. G. Bird, Christow. |
| G. D. | = Mr. G. Doe, Castle Street, Great Torrington. |
| G. M. D. | = Mr. G. M. Doe, Castle Street, Great Torrington. |
| W. S. M. D'U. | = Mr. W. S. M. D'Urban, Albert Memorial Museum, Exeter. |
| E. P. G. | = <i>Exeter and Plymouth Gazette</i> (Exeter Newspaper). |
| J. G. | = Mr. J. Gatcombe, Durnford Street, Stonehouse. |
| H. S. G. | = Mr. H. S. Gill, Exe Villa, Tiverton. |
| G. C. G. | = Rev. G. C. Green, Vicarage, Modbury. |

N. S. H.	= Mr. N. S. Heineken, Sidmouth.
H. S. H.	= Dr. H. S. Hounsell, The Woodlands, Torquay.
A. R. H.	= Mr. A. R. Hunt, Southwood, Torquay.
M. A. M.	= Rev. M. A. Mathew, The Vicarage, Bishops Lydeard, Somerset.
H. N.	= Mr. Henry Nicholls, Roseland, Kings- bridge.
E. P.	= Mr. E. Parfitt, Devon and Exeter Institu- tion, Exeter.
W. P.	= Mr. W. Pengelly, Lamorna, Torquay.
F. P.	= Mr. F. Pershouse, jun., Tor-mohun House, Torquay.
H. E. R.	= Rev. H. E. Rawson, The Vicarage, Bromley Common, Kent.
E. S.	= Mr. E. Smith, 8, Strand, Torquay.
T. D.	= <i>Torquay Directory</i> (Newspaper).
T. T.	= <i>Torquay Times</i> (Newspaper).
W. M. N.	= <i>Western Morning News</i> (Plymouth News- paper).
W. T.	= <i>Western Times</i> (Exeter Newspaper).

The *Memoranda*, forty-one in number, have Arabic numerals prefixed to them, and are arranged under ten heads—Archæological, Botanical, Centenarian, Ceramic, Geological, Hydrographical, Meteorological, Mineralogical, Numismatical, and Zoological—to each of which a Roman numeral is prefixed.

Each writer is, of course, solely responsible for the statements he makes. In this Report, as in its predecessors, speculation has been kept in abeyance; the contributors believing that the collecting of facts was the work committed to them.

I. ARCHÆOLOGICAL.

1. NEOLITHIC AXE :—"In June, 1879, a workman, engaged in taking down an old cottage at Berry Cross, in the parish of Langtree, near Great Torrington, North Devon, found in one of the rooms a stone implement, which may be briefly described thus: It is 6 inches in length, 3·75 inches in breadth at its widest part, and 1·75 inch in thickness near the centre, where a funnel-shaped hole, of the depth of ·5 inch, and diameter at surface of 1 inch, has been sunk on each face. It appears to have been formed from a water-worn stone by grinding each end to a rather sharp edge.

"I have consulted four skilled geologists as to the nature

of the stone, but the doctors disagreed—two of them considering it to be greenstone, whilst the other two believed it to be carboniferous quartzite. The weight of the stone is 2 lbs. 1 oz. avoirdupois.

"The implement is somewhat similar to a stone hammer, described and figured in Mr. Evans's *Ancient Stone Implements, Weapons, and Ornaments of Great Britain* (pp. 214, 215, fig. 161, ed. 1872); but the fact of the Berry Cross tool being ground at each end seems to indicate that it was intended for an axe or 'cleaver' rather than a hammer.

"It had been used by the last tenant of the cottage for keeping open a door, but I have not been able to obtain any information as to the place whence it came, or the person by whom it was brought into the house." (G. D.)

II. BOTANICAL.

2. FUNGUS:—

"Sir,—Mr. Daw has kindly forwarded to me to-day the largest specimen of the scaly many-pored fungus, *Polyporus squamosus*, that has ever come under my notice. Although I have made the fungi a study for at least twenty-five years, and have figured and described 1,150 species indigenous to Devonshire, I have not before seen one so large as this. The size of the specimen is two feet in diameter, and the thickness from half-an-inch to two-and-a-half inches. The black knob-like root from whence the pileus springs measures seven inches one way by five the other, the whole weighing fourteen pounds. This species, with all the others belonging to the genus *Polyporus*, grows on decaying wood, such as old palings, fallen timber, and stumps of trees. Some species are peculiar to some trees; others grow indiscriminately on any decaying wood. The one we have under consideration grows principally on stumps of elm and ash trees.

June 13th, 1879.

E. P.

P.S.—I have sent the specimen to the Museum."

(*W. T.*, 17th June, 1879.)

III. CENTENARIAN. (?)

3. MISS BOLES:—"A Devonshire centenarian has just joined the fellowship of the unseen. The maiden sister of the late General Boles, of Cranford, died last Thursday [17th July, 1879], at Bicton Place, Exmouth. She attained her hundredth year last April twelvemonth." (*W. M. N.*, 21st July, 1879.)

Finding that the Rev. J. N. Boles, of Crowcombe Rectory, near Taunton, was a nephew of Miss Boles, the reputed

centenarian, I applied to him for information. In his reply, dated 30th July, 1879, Mr. Boles says of his aunt, "She was only in her hundredth year, having been born on the 27th April, 1780."

Mr. Boles adds that his aunt, Miss Jane Boles, was the fourth daughter and seventh child of Thomas and Grace Boles of Moyge, Co. Cork.

IV. CERAMIC.

4. JAR IN THE ENGLISH CHANNEL:—"On 2nd April, 1880, the 'Pelican' trawler, belonging to Mr. W. M. Baynes, of Torquay, took, in her trawl, at that part of the English Channel whence the Start Point was about 20 miles distant in the direction N.W. by compass, that is, about W.N.W. true, a large pyriform, unglazed earthenware jar, which Mr. Baynes presented at once to the Torquay Natural History Society, of which he is a member.

"The jar is of stone colour, inclining to red towards the base. Its height is about 24 inches externally and very nearly 23·625 internally, so that the thickness of the bottom is rather less than ·5 inch. Every section at right angles to its height is, or was intended to be, circular, and it attains the greatest girth about 13 inches high, where it measures 57 inches. Thence it tapers in both directions, but more rapidly downwards than upwards. Its external girth at the base is 25 inches. The tapering upwards is not considerable until very near the top, where it curves inward so suddenly as to give an almost flat surface. The vent is cylindrical, and measures 8·25 in girth externally. By filling it with water, the jar was found to hold 103·25 imperial pints, or 13 gallons nearly. It was subsequently found to have within it fully half a pint of gravel.

"It is by no means a fine specimen of the potter's art. A vertical section through the centre of the base would show that one side was more convex than the other, and that the curve from the point of greatest girth towards the base was, instead of being everywhere convex, here and there concave.

"Two large ear-like handles are placed very near the top, and at each root of both of them there are three circular impressions, such as might have been, and probably were, produced by the application of the workman's fingers. They stand at the angles of an inverted isosceles triangle, having a small vertical angle.

"Between one of the handles and the vent there is an in-

scribed or impressed circle, rather larger than a penny-piece, having within it the letters D V, and between this and the vent are five small square punctures in a straight line, the whole with the interspaces measuring 1·1 inch.

"On the exterior, the whole surface of the bottom as well as about fully one half of the entire lateral surface, from the base to the vent, is covered with marine organisms of different kinds, including Serpulæ, egg-cases of Buccinum in large quantities, and various species of Hydroida and Polyzoa. The Rev. Thomas Hincks, B.A., F.R.S., has been so good as to hand me the following list of species he identified on the jar:—

"HYDROIDA (4 Species).

Fillelum serpens, Hassall, in great profusion, forming a network over the surface of the jar.

Coppinia arcta, Dalyell (on *Sertularia abietina*).

Hydrallmania falcata, Linn.

Sertularia abietina, Linn.

POLYZOA (17 Species.)

Membranipora flemingii, Busk.

Microporella ciliata, Pallas.

M. malusii, Audouin.

M. violacea, Johnst.

Chorizopora brongniartii, Audouin.

Schizoporella linearis, Hassall.

S. unicornis, Johnst.

S. auriculata, Hassall.

Hippothoa divaricata, Lamx.

Porella concinna, Busk.

Smittia trispinosa, Johnst.

Mucronella peachii, Johnst.

Cellepora pumicosa, Linn.

Tubilipora lobulata, Hassall. Very fine. Not of very common occurrence on the Devon coast.

Stomatopora ? sp. (young.)

Diastopora suborbicularis, Hincks.

Lichenopora hispida, Fleming.

(Signed) T. HINCKS, 19th April, 1880."

"There was found in the jar, most of it adhering to the bottom, fully half a pint of sand and gravel, consisting of organic exuvæ, with subangular and rounded stones, the largest of which scarcely exceeded a hazel-nut in size. The stones were mainly flint fragments, identical in character with those so prevalent on various strands between Dart-

mouth harbour and Plymouth Sound. Mingled with them were a few bits of limestone—all perforated by marine organisms—as well as of quartz and granitoid rocks.

“The pieces of flint have a peculiar interest for me, for as long ago as 1870 I directed attention to the facts that no river west of the Teign was capable of carrying flints to the sea; that, with very few local exceptions, our beach materials travelled up channel; that, nevertheless, flints occurred on every shingle beach along the entire sea-board of Cornwall and Devon; and that all the Raised Beaches, from the Land's End to Dorset and Somerset shires, contained flints also. At the same time I suggested that, in order to solve the problem of the derivation of the flints on our western strands, some one should carefully dredge the English Channel to ascertain whether or not there were in it any submarine outliers of gravel containing chalk flints. (*Jour. Roy. Inst. of Cornwall*, iii. 266, 267.) In the same year (1870) I elsewhere, when dealing with the same question, quoted a letter received from Mr. Whitley, of Truro, to the effect that flint shingle was known to exist in the bed of the sea near Lundy Island in the Bristol Channel, and off the Dodman Point in South Cornwall; and I stated, on the authority of Mr. T. H. Pitts, that the Skerries, a well known shoal in Start Bay, contained gravel identical with that on the adjacent Slapton Strand, South Devon, where flint is remarkably prevalent. (*Trans. Devon. Assoc.*, iv. 203–5.) In 1877 I once more urged the desirableness of dredging the English and Bristol Channels (*Ibid.*, ix. 420, 421); and the good temper of my yachting friends has alone kept them from any display of impatience at the importunity with which I have besought them to dredge at least parts of the English Channel, with a view to the solution of this problem.

“The jar was met with 20 miles E.S.E. of the Start Point, far without the 30 fathoms line, and there can be no doubt that it has brought us thence most conclusive evidence that there is there an accumulation of gravel in which flint *débris* is very plentiful, and that it possesses the characters of that so abundant on Slapton beach, as well on some of the beaches in Bigbury Bay.

“Mixed with the gravel within the jar was a portion of a small earthenware vessel, not unlike the shape of rather less than half a lemon cut at right angles to the longest axis. The outline of the section is sensibly circular, measuring 1·6 inch in diameter externally and 1·35 inch internally. The present external height of the vessel is 1·1 inch. In one of

its sides there is a square puncture, about .1 inch in the side, and passing quite through it. That this was made before the vessel was fired is evident from the condition of the edges of the aperture on the inner surface. The puncture has a close resemblance to the five near one of the handles of the jar, mentioned already. Whether the occurrence of the vessel within the jar was fortuitous or not it would be difficult to prove in the absence of further evidence; but the probability is that it was not, and this is strongly supported by the fact that amongst the gravel were many small fragments of the same kind of pottery—bits, no doubt, of the vessel itself. It has been suggested that, when entire, this vessel was the stopple of the jar. If this be correct, and it seems not improbable, it must have been considerably larger when whole, or it must have been supplemented in some way.

"It may, no doubt, be safely concluded that the jar underwent little or no movement after reaching the sea bottom, as there are no traces of abrasion anywhere on its surface. The same fact points to the conclusion that there was very little movement of the gravel there; at any rate, even small stones could not have frequently traversed its surface. Of storm-wave movement there could have been none, and of tidal-wave movement very little. The jar seems to have laid on one side, as might have been expected from its shape. That its entire base, and about one half of its lateral surface longitudinally, was above the sea bottom the marine incrustations show; whilst their entire absence elsewhere seems as certainly to indicate that all the remainder was buried in the sandy gravel; the lower margin of the vent being on or very near the sea bottom.

"That the jar is quite modern there seems no reason to doubt. What may have been its use, and what the land of its birth, are, so far as I know, matters of opinion only. Some are inclined to regard the circle with the letters D V within it as a fanciful mode of writing "O. D. V." and to infer from that hypothesis that it was a brandy jar; but this is repudiated by the Torquay wine merchants. Others pronounce it an oil or a wine jar from the Spanish peninsula. That it once contained oil I have little doubt, and that it was probably a remnant of this substance which caused the gravel to adhere to the bottom of the jar, and many of the grains of sand to stick together after they were dislodged.

"I fear my endeavours to identify the jar by means of the letters near one of its handles have not been successful. In *Marks and Monograms on Pottery and Porcelain* . . . By W.

Chaffers, F.S.A., CIO. 10CCC. L X III, kindly lent me by Mr. J. E. Lee, of Torquay, the following is the only statement which can be supposed to have any bearing on the question :—

“*MEMECY. Soft Paste.* Founded in 1735 by François Barbin, who was succeeded by Messieurs Jacques and Jullien ; it was under the protection of the Duc de Villeroy. The mark is D. V. impressed. The lease of these works expiring in 1773, they removed to Bourg la Reine.” (p. 203.)

“The D. V. mentioned here is probably not to be confounded with the D V on the jar.” (W. P.)

V. GEOLOGICAL.

See *Memoranda*, 4, 11, pp. 73, 81.

VI. HYDROGRAPHICAL.

See *Memorandum*, 4, p. 73.

VII. METEOROLOGICAL.

5. THUNDERSTORM (2nd August, 1879):—“The midland, southern, and south-western counties of England were visited by severe thunderstorms, commencing on Saturday, 2nd August, 1879, and continuing at intervals until the next morning. According to the local newspapers it was, in Devonshire, attended by violent wind and rain, and in some places by hailstones of great size. A horse was killed in a field near Salmon Pool, Exeter ; at Westerland in the parish of Marldon, near Paignton, a barn was found to be on fire, and was believed to have been ignited by the lightning ; the chimney stack of a house in the Vansittart Road, Torquay, was struck, and a portion of it fell through the roof ; the grate in a sitting room of the same house was forced out, and the clothes of a lady were set on fire.” (W. P.)

6. THUNDERSTORM (30th December, 1879):—“The unsettled weather of Monday [29th December] was followed at Plymouth by a comparatively fine night, and the earlier hours of yesterday were calm ; but between seven and eight o'clock a violent thunderstorm broke over the town, and was accompanied by heavy hail and rain. During the day there were fierce squalls of wind and rain, but towards nightfall the weather became finer, and has so continued.

“A severe thunderstorm passed over Modbury about half-

past seven o'clock yesterday morning. The lightning was very vivid, and the wind blew a hurricane, rooting up some trees in the neighbourhood, and damaging the roofs of some of the houses in the town. Fortunately its duration was only twenty minutes, but the weather continued stormy throughout the day.

"Brixham fishermen on arriving in port reported the weather in the Channel to have been very severe on Monday night and yesterday, it being so squally that they remained under close reefed sails the whole of the time. Every shower was accompanied by a different wind, which veered from N.W. to S.W. by S. At dawn, when the boat was seven miles off Bolt Head, a heavy clap of thunder broke over the fishing smack *Bonny Lass*, accompanied by vivid flashes of lightning, and two of her crew, who were standing together, were laid prostrate on the deck by the effects of the electric fluid. Fortunately they escaped unhurt; but they described the sensation experienced as that of a severe blow on the head inflicted by something heavy falling from aloft. The lightning passed down the fore hatchway, near which the men were at the time, and then through the hold, entering the cabin. Such was the illuminating power of the lightning that the captain, who was on deck near the companion, rushed below, thinking the cabin was on fire, but all was in darkness when he got there. Several of the trawlers received damage to their fishing gear. The *Rose* parted her trawl warp, and lost all; and the *Vega* collided with the *Greyhound*, and both having their trawls down, the former had her trawl warp cut off, and lost everything. Several others had damage done to their fishing gear. No damage on land has been reported." (*W. M. N.*, 31st December, 1879.)

7. THUNDERSTORM (30th December, 1879):—"On Tuesday, the 30th [December, 1879], several portions of Devonshire were visited by a severe thunderstorm. The *Dartmouth Chronicle* gives the following account of the church at Stoke Fleming having been struck by lightning during the storm: 'On Tuesday morning, William Grant, an apprentice to Mr. Hole, of the Quay, Dartmouth, was sent to Stoke Fleming to wind up the church clock, which is done weekly. He entered the tower about 11.15 a.m., and after lighting a couple of candles, mounted the clock-stage, and was in the act of winding, when a tremendous flash of lightning struck the building with terrific force. Grant was knocked off the platform, which is about four feet high, to the floor, and for a few

seconds was rendered senseless. The candles were extinguished, and the place being in darkness, he groped his way down by a long ladder leading to the belfry, and ran across to the Green Dragon Inn for shelter, but how he got down the ladder is a mystery to him. Had he been ascending or descending the ladder at the time of the occurrence he would in all probability have been killed. The rector, the Rev. E. St. Aubyn, and other gentlemen, were soon on the spot, and an examination proved that the lightning had entered through the tower in two places, and went down the ladder into the belfry, the floor of which was ripped up and splintered. It then made an aperture in the side wall of the church, and appears to have expended its force against the pillars at the entrance gates, the pillars being shattered and stones removed in a most curious manner. The shock was felt in many other parts of the village, Mrs. Martin, of the Green Dragon, being knocked down, but sustained no injury. The damage done to the church, which some few years since was almost completely rebuilt, is estimated at about £200." (*T. D.*, 17th January, 1880.)

The Rev. E. St. Aubyn, rector of Stoke Fleming, writes me that the foregoing statement is quite correct, except in one particular only—the damage done to the church was estimated at £50, not £200. He adds, "the summit of the tower has not yet been repaired." (22nd May, 1880.)

8. (a) THUNDERSTORM (3rd May, 1880):—"During the thunderstorm which broke over Exeter, shortly before three o'clock, on Monday, May 3rd, 1880, an extraordinary proof of its violence occurred at Belmont, the residence of the Rev. H. L. Houlditch, on the Cowley Bridge Road. Between a quarter and half-past three the lightning struck two noble elm trees situated on the lawn in front of Belmont House, and mutilated them in a most surprising manner. The bark was either stripped from the trunks, or so detached that it hung like a loose garment. Great pieces of wood, 27 and 18 feet long, 10 inches broad, and 2 to 4 inches thick, were torn away, and the bark stripped off as cleanly as if it had been done by woodmen. Large splinters were scattered all around, one being carried 135 feet in a westerly direction, another the same distance in a south-westerly, and another 172 feet in a north-westerly, while other parts of the *débris* were hurled right into the Cowley Road; and a huge limb, 5 feet 3 inches in circumference, was severed from the parent tree

with a force that must have been terrific. Twenty-two windows were broken in the dwelling-house by the explosion, and forty-two in the conservatory. Had the electric fluid struck the house, the consequences would no doubt have been fatal to the inmates. The peal of thunder which followed the flash that wrecked the elms at Belmont shook the houses throughout Exeter, in some instances causing the knockers of the door to give two or three smart raps, and shaking keys out of locks. A gentleman who had been in the midst of thunderstorms in the West Indies told us that he never heard there more deafening discharges of heaven's artillery than those which stunned his ears last Monday in Exeter. The storm was as short as it was severe. It commenced a few minutes before three o'clock, and subsided by twenty minutes past, returning with a single flash and lighter thunder-clap threequarters of an hour later." (*E. P. G.*, 4th May, 1880.)

(b) Mr. Parfitt has kindly supplemented, with the following statements, the account given above, written by some one unknown to me:—

"The three trees were of large size, and about 60 feet high. That most injured was struck about 50 feet from the ground. The electricity first struck a large branch, and from this ran down the trunk, the path of the current growing wider as it approached the base. In its passage it ploughed out and splintered off the two large pieces mentioned above, with the large arm which chanced to be in its way. The smallest of the two pieces was literally torn into a fibrous mass. The lightning struck the trees on the north-west side. The second tree was struck about 30 feet from the base. This tree, standing about 20 feet from the former, and nearer the dwelling-house, was not so much injured; some of the bark was torn off in long ribband-like pieces, and some large pieces of bark were loosened as if the electric current travelled between the bark and the tree. From the base of this tree the current ploughed up the ground in a zigzag manner (making a passage 3 inches in width and depth) to some iron railings, where it buried itself in the earth, throwing up the turf for about 2 feet in diameter.

"It is supposed that the electric discharge, after leaving the first tree, flew across the lawn without injuring it or ploughing it up in any way, and then struck the earth under some iron railings 28 yards off in an easterly direction; for there the turf and earth were torn up in a place about two or

three feet in diameter and about a foot deep. Directly in front of this pit, at a distance of 65 feet, was the conservatory, where forty-two panes of glass were broken. The glass in the house, and in all cases where the windows were vertical, was, so far as I could ascertain, blown outwards—not driven inwards—by the force of the discharge." (E. P.)

9. METEOR:—"On Friday, 21st May, 1880, at 8h. 45m. p.m., Greenwich time, I saw from one of the windows of Woodlands, Torquay, a meteor in a S.S.W. direction, about twice the apparent size of the largest planet, of a pale yellow colour, about 30° above the horizon. It moved in a direction almost due east, and without apparent change of altitude. Its motion was slow, and it remained visible long enough for the persons in the room, whom I called to the window, to see it also. We heard no report, but I am not prepared to say whether or not there were any corruscations. The moon at the time was about an hour east of the meridian, and shining so brightly as almost to drown the light of the meteor, especially as the two bodies were nearly in the same part of the sky; the meteor, in fact, passed directly under the moon." (H. S. H.)

VIII. MINERALOGICAL.

10. (a) BISULPHIDE OF IRON:—"On 21st May, 1880, the Rev. G. G. Bird, of Christow, near Chudleigh, directed my attention to the fact that metallic balls, which he believed to be mundic, were found somewhat plentifully in a manganese mine, near the village of Bickington, in a black rock, which required to be blasted. A day or two afterwards he was so good as to send me three specimens of the balls, which, as he had supposed, were mundic or, to use the scientific name, *Bisulphide of Iron*, but of a lighter colour, or less brass-like, than the ordinary mundic. They were all sensibly spherical, and varied from 1·1 inch to ·4 inch in diameter. The surface of each may be described as a somewhat irregular pavement of the cubes in which, as is well known, mundic crystallizes; and, so far as the three specimens went, the larger the ball the larger the cubes.

"On 29th May I visited the mine for the purpose of supplementing the information I had received, as well as to collect additional specimens.

"The mine is very near Stancombe farm house (Standcombe on the map of the Ordnance Survey), in the parish of Ilsington, South Devon, from ·25 to ·5 mile north of the

road from Chudleigh to Ashburton, and about 4 miles from the latter town.

"From information given me on the spot by two intelligent and very obliging miners, the 'Level' or 'Adit,' which was then being cut for the purpose of intersecting the 'Lode' of manganese, had attained a length of 70 fathoms, where it was, by estimation, 30 fathoms 'from grass,' that is below the surface. Its width was 4 feet, and height from 6 to 7 feet. The mundic balls first attracted the attention of the workmen at 60 fathoms from the mouth of the Level, and thence to the farthest point reached, that is through a length of 10 fathoms, they had been met with more or less abundantly. Whilst they usually assume a spherical form, pyriform and ellipsoidal balls, and even irregular masses, are occasionally met with; and I found one instance of a small spheroid attached to the surface of a larger one, with, perhaps, a very thin layer of the rocky matrix between them.

"The matrix or rock is an almost black shale, harder than ordinary limestone, but capable of being faintly scratched with a knife; and lumps and specks of mundic are distributed, here and there, throughout it.

"Divisional planes, generally known as 'Joints,' but termed 'Heads' by the miners, are prevalent in the rock. Most of them are close fitting, and their presence is only indicated by the edge of a whitish film of, what may be called, extraneous matter lying between the faces; whilst some of the planes, having no such films, exhibit 'slickensides.' The cavities occupied by the balls are usually lined with the white filmy matter just mentioned, which adheres to the matrix rather than to the ball, and is just as hard as the matrix. Both the joints and the films of whitish matter pass occasionally quite through the spheres, and in, at least, some instances the whitish filmy lining of a cavity whence a sphere has been dislodged displays impressions of the faces of the cubes on the surface of the dislodged sphere; thus showing that the joints were formed after the balls, and that the segregation or infiltration—as the case may be—of the whitish matter was, in its turn, subsequent to the formation of the joint. A few of the balls have portions of the matrix adhering to parts of their surfaces.

"The largest ball I obtained measured 1·6 inch in diameter, and this the workmen stated was the largest they had seen.

"By searching amongst the heap of rock fragments brought out of the Level it is easy to make a large collection of interesting specimens—some perfect, others broken; some lying

in the matrix partially disclosed, and others completely dislodged.

"Most of the broken specimens exhibit an internal radiating prismatic structure, whilst a few display, in addition, a concentric arrangement. One of the specimens I obtained is a portion of a large ellipsoid, having a distinct and somewhat irregular envelope, formed also of mundic.

"According to the map of the Geological Survey, the rock in which the mine exists belongs to the Carboniferous System, and is such as may be seen near South Tawton, and elsewhere in Devon. The district is one of great geological variety and interest. Within a mile of the mine are Devonian limestones, Devonian slates and grits, Greenstones, the Bovey Lignites and Clays, and, if the map is to be believed, a small patch of Greensand, but which, in all probability, is a deposit of more recent age, made up of the *wreck* of Greensand." (W. P.)

(b) Mr. E. Smith, F.C.S., of Torquay, a member of the Association, to whom I handed a few of the specimens with a request that he would favour me with any remarks he might have to make respecting their chemical composition, has been so good as to send me the following statement:—

"I have examined the spherical nodules, and append the result. They consist almost entirely of Bisulphide of Iron. The specific gravity (4·85) is somewhat below that of ordinary Iron Pyrites, which commonly ranges from 4·9 to 5·1. The colour too is paler than, and the crystalline structure differs from, that of common pyrites; they are evidently the variety known as "White Mundic."

"When the Bisulphide of Iron is removed by solution, there remains a black carbonaceous residue amounting to 3·1 per cent.; of this ·6 volatilizes when ignited on Platinum foil, leaving a nearly white residue of Silicate of Alumina.

"The black residue is apparently identical with the rock in which the nodules are embedded.

"The following is the result of analysis:—

Bisulphide of Iron	.	.	94·3	
Silicate of Alumina	.	.	2·5	} Black residue
Volatile Carbonaceous Matter	.	.	·6	
Phosphoric Acid and Lime	.	.	traces	
Moisture and Loss	.	.	2·6	
			<hr/>	
			100·0	

"Specific gravity 4·85." (E. S.)

IX. NUMISMATICAL.

12. SILVER COIN :—"A small silver coin of Edward ?, weighing 17 grains—'Civitas London'—was found on Sidmouth Beach, in February, 1880, and is now in the collection of Mr. P. O. Hutchinson, of Sidmouth." (N. S. H.)

13. SILVER PENNY :—"A silver penny of Elizabeth, weight over 6 grains (normal weight 7 grains), was found on Sidmouth Beach, in February, 1880, and is now in the collection of Mr. P. O. Hutchinson." (N. S. H.)

14. SILVER COIN :—"A thin silver coin about three-quarters of an inch in diameter, was dug up in the open ground near the Manor House, Sidbury, near Sidmouth, in April, 1880, and is now in the possession of Mr. Boase, the Clerk of the Works. Obverse: The King's full face, with 'NEURIUM' legible in the margin. Reverse: Much worn, two arms of the cross visible, with three pellets between, and 'ON' in the margin, perhaps for [CIVITAS LOND] ON." (N. S. H.)

15. SILVER PENNY :—"A silver Lydford penny of CNUST was recently found near Tavistock, and is now in the collection of Mr. W. Gill of that town. Obverse: '† CNVT. REX. ANG.', King's bust to right, with sceptre before him, and conical helmet on his head. Reverse: '† PYNSIGE : ON. LVDEN.' [Ford. left out]. Device, a double circle and cross." (H. S. G.)

16. COPPER TOKEN :—"In July, 1879, Lieut.-Colonel Harding, of Upcot House, Pilton, Barnstaple, presented me with a copper Devonshire Token from his fine numismatic collection. Obverse: 'JOHN. MABAR.'—The Grocers' Arms. Reverse: 'IN EXON. 1663.—I. R. M.'

"From the arms of the above associated Company in the field,—consisting of a chevron between nine cloves, three, three, and three—it is evident that the issuer was a grocer.

"This Token was quite new to me, as well as to all other collectors with whom I am acquainted." (H. S. G.)

17. BRASS TOKEN :—"On the same occasion Col. Harding presented me with a brass Devonshire Token, also from his own collection. Obverse: 'JOSEPH. MEDLTON'—A full-blown Rose. Reverse: 'OF. CREDDYTON.—I.M. 1667.'

"The name of the issuer is perhaps that now commonly

written MIDDLETON. We cannot infer from the device in the field what was his occupation, but he may have kept the *Rose Inn*.

"This Token also, which, like that last mentioned, passed as a farthing, was quite new to me and to all collectors of my acquaintance.

"The total number of distinct Tokens of that period, issued and circulated in Devonshire, at present known to collectors, amounts to 342." (H. S. G.)

With regard to Mr. Gill's suggestion, the *Rose Inn* appears to have been formerly a very common English sign-board. (See *History of Sign-boards*. By Larwood and Hotten. 6th ed., pp. 124-6), and may have existed in Devonshire. In 1872, however, there was no such sign in this county. There were ten instances of the *Rose and Crown*, but Crediton did not boast of one of them (see *Trans. Devon. Assoc.* v. 456); and the *Rose* had no other form of sign-board existence anywhere within our boundaries. (W. P.)

X. ZOOLOGICAL.

18. DOG:—"On the 27th November last, Mr. Moss Millar, chemist, of Torwood Street [Torquay], was shooting near Ashburton, and during the day missed his spaniel. A deep shaft was near the spot where the dog was last seen, and it was thought the animal might have fallen in; but, if so, listening at the top for some time resulted in obtaining no evidence of the fact. The dog was a valuable one, and Mr. Millar and Mr. Tucker, who was with him, gave up the search with reluctance, and in despair of again having it. On January 10th, however, Mr. Tucker wrote as follows to Mr. Millar:

"I am sure you will be delighted to hear I have, after so long a time, got your poor dog, and all alive and well. Yesterday afternoon I had a ferret lie in a hole near the pit in which your dog fell, and I sent a boy to wait for it. While he was there he heard the dog howling. He came and told us of it, and of course none of us believed it; but I sent my man there and he heard it as well. It was growing very dark, so nothing could be done that night. However, he went to a sheep that was lying dead about half-a-mile distant, and cut off a leg of it and threw it down; he distinctly heard the dog eating it. By that time it was after seven o'clock, and we were gone home. The man came to Ashburton to tell us all about it, and this morning I went to a miner and asked him if he would go down after it. He said he would, so my son put the horse in the trap and drove him out directly. We got some

good poles and threw across the mouth of the pit. He made a chain fast to it, which was 60 feet long, but it did not reach the bottom, so he had to pull it up again and make fast a rope to the end of it, and let the chain and rope down the pit. After this the man was very soon at the bottom, and he halloed up to say the dog was all right. I can assure you it was a joyful moment for us. I think it a most extraordinary thing, as my man went to the pit for days after it fell down, but could not hear a sound. I cannot understand the affair at all, as she could have made scarcely any noise or my man would have heard her. Even before the miner went down we called her and could not hear a sound. The man found she had water continually dropping, but it soaked away as fast as it dropped, so she could have water at any time, and lie comparatively dry. There was a hole about three feet in under in which was a beaten place where she, it appears, always slept. There was not a bone to be found there, except the mutton that the man threw down the evening before, and of that she had eaten but very little. No doubt there had been rabbits fall down from time to time, and upon the bones of them and what remained besides she must have lived all this time. I am surprised she kept so quiet there; if she had made any noise my man would have most certainly heard her, as he went to the place daily after she fell in, but could not get a sound from her.'

The dog, which had lost 26lbs. in weight, is now as well as usual." (*T. T.*, 17th January, 1880.)

Mr. Moss Millar, on whom I called, informed me that the foregoing statement was perfectly correct; that the dog's weight was known to be 56 lbs. when she was lost, and that on being weighed four days after her liberation she was no more than 30 lbs. A statement of the case, by Mr. Moss Millar, appeared in the *Field* for 17th January, 1880, and, with the exception that he says "we distinctly heard her fall—thud, thud, thud!" corresponded strictly with the cutting from the *Torquay Times*. (W. P.)

19 (a.) **ELEPHANT'S TUSK**:—"Fisherman Fleet on Tuesday brought up with his trawl net, just under Dartmouth Castle, an elephant's tusk, five feet nine inches long and about seven inches diameter. It is very much discoloured, but appears to be sound. It is now in the possession of Mr. Lidstone, jeweller, North street. It is supposed to be part of the cargo of a ship wrecked many years ago, other tusks having been found in the same neighbourhood, one of which is said to be in the possession of Mr. Cranford." (*W. T.* 13th February, 1880.)

(b.) "On 14th February, 1880, I visited Dartmouth for the purpose of seeing the tusk, being desirous of ascertaining whether or not it was a relic of the Mammoth = *Elephas primigenius*, Blum., of which species so many remains have been derived from the *Submerged Forests* of South Devon. (See *Trans. Devon. Assoc.* vol. i. Pt. 4, p. 30, iii. 143, v. 39, vi. 235.)

"On calling at Mr. Lidstone's, who, by the way, lives not in North Street, but in Lower Street, I learned that the specimen had been sent off to an ivory merchant in London, about an hour before my arrival. On reading the foregoing cutting to Mrs. Lidstone, she was so good as to inform me that the statements it contained were perfectly correct, and to add that the length—69 inches—mentioned in the *Western Times* was the measurement along the curve of the tusk, but that it measured in a straight line, from point to point, 64 inches; so that the curvature was so inconsiderable as to render it almost certain that it was a relic, not of the Mammoth, but of the Asiatic Elephant = *Elephas indicus*, or of the African Elephant = *Elephas africanus*. Mrs. Lidstone also informed me that the tusk weighed 80 lbs.

"I was so fortunate as to meet with Thomas Fleet, by whom the specimen was found. He told me that he was an oyster dredger and oyster dealer; that he took up the tusk in his dredge on Tuesday, 10th February, 1880; that it was lying on a bed consisting of oysters, oyster shells, and stones, in 9 fathoms water, at low water; that a living oyster was still attached to the tusk in the cavity at its base or larger end; that it was of a brown colour, but that there was no trace of peat mingled with the materials of the bed; and that a tusk, he believes the same, was caught in his dredge about a year ago, but slipped out before it could be secured.

"He added that within the last 18 or 20 years a total of seven tusks had been found at the same place, by his two brothers and himself:—four by James Fleet, two by Alfred Fleet, and one—the specimen under notice—by himself, Thomas Fleet; and that one of them had been sold to Mr. R. Cranford, of Dartmouth, who still retained it.

"On calling on Mr. Cranford, he was so good as to show me his specimen, which, though large, did not attain the dimensions of the new "find." It was of a light-yellow colour, and one surface had on it a considerable number of circular depressions of the size of rather small limpet shells, from which the other surface was quite free. I was assured by all who had seen it that the relic just found had no such defects; in short, that it was perfectly sound. Mr. Cranford's specimen

is not more curved than the tusks of existing elephants, whilst all writers regard a great amount of curvature as characteristic of the extinct mammoth. (See *Pen. Cyclo.* ix. 347; Prof. Owen's *Hist. Foss. Brit. Mam.* pp. 244-8.)

"The *Dartmouth and Brixham Chronicle* for 13th February, 1880, published by Mr. R. Cranford, speaking of the tusks found from time to time at the mouth of the harbour, says, "They no doubt formed part of a cargo of a valuable prize, which was captured by Dartmouth Privateers and burnt at her anchors, in the Bight, upwards of two centuries ago." Writing me on the 6th March, 1880, Mr. Cranford stated that his authority for this statement was "An Account of the Capture of the Carrack 'Madre di Dios' in 1592. It will be found," he continued, "in the *Transactions of the Society of Antiquaries* and in *Archæologia*, vol. 33, and was reprinted in *Dartmouth Chronicle* of September 11th, 1874."

"Apart from this evidence, apart also from the small curvature of the Dartmouth specimens, it is not probable that so many as seven tusks of the Mammoth, an extinct species, would be dredged up in one and the same spot; and that no other relic of the creature should be found. In short, I have little or no doubt that the Dartmouth tusks belonged, not to *Elephas primigenius* (= Mammoth), but to *E. indicus*, or to *E. africanus*.

"I find that the paper in *Archæologia* (xxxiii. 209-240, 1849) is entitled *Notes upon the Capture of the "Great Carrack" in 1592*. By William Richard Drake, Esq., F.S.A., and was read to the Society of Antiquaries, May 10th and 17th, 1849. It appears that the "Madre de Dios," or "The Great Carrack," was captured by an expedition designed by Sir Walter Raleigh; Queen Elizabeth, Sir John Hawkins, and some of the principal merchants of London, were his partners in the adventure; that the actual capture was the work of Sir John Burgh, or Burrowes, aided by a fleet of ships belonging to the Earl of Cumberland; that the ship belonged to the crown of Portugal, was captured on 4th August, 1592, and reached Dartmouth, 8th September, 1592; and that the prize, the largest that had ever been brought to the shores of England, stimulated, if it did not lay the foundation of, the direct traffic of this country with India. The paper contains a detailed account of the goods in the ship, but without any mention of ivory or elephants' tusks. The ship remained at Dartmouth up to 1594, but the paper is silent respecting her subsequent fate." (W. P.)

20(a). MOLES, CREAM-COLOURED:—The following paragraph, believed to have been copied from *The Field* for the previous week, appeared in *The Western Times* for 14th October, 1879:—"WHITE MOLES IN DEVON. I had a white mole caught last week in one of my fields close to this house, and there is rarely a year passes in which one or more of these white moles is not caught here. A few years ago, two were caught in one day, when the mowers were cutting one of these fields for hay. I have kept some of the skins, and had them made into purses." (G. C. G.)

(b) The Rev. George Clarke Green, M.A., Vicar of Modbury, who has kindly allowed me to say that he was the writer of the paragraph, wrote me as follows on 17th October, 1879:—"My mole and all the moles of which I have spoken are a *creamy white*, such as persons in general would speak of as 'white,' and just the same colour as I have known in white varieties of the lark, swallows, starlings, &c., but they are not as white as white mice and white rabbits, not a pure snow-white. . . . My mole is as white, in those parts which are not at all soiled, as an ordinary sheet of cream laid note paper." (G. C. G.)

The following quotation from Mr. Bell (*Brit. Quad.*, 2nd ed., 1874, p. 139) may be of interest in connection with the foregoing statements:—"There are several remarkable varieties of the present species [The Common Mole = *Talpa europæa*, Linn.]: it is found of a deep black colour, of a mouse grey, dark olive brown, pied, yellowish white, and wholly or partially orange. We have received from Switzerland (Berne) several examples of the usual dark colour, but having a well defined lozenge-shaped patch of orange on the breast."

Mr. Green, writing me on 31st December, 1879, said, "My dog caught another white mole last Saturday week" [20th December], "the cleanest and whitest I ever had." On 25th May, 1880, he added, "I have had at least eight or nine white moles since I wrote to you." (G. C. G.)

21. VOLE, BANK OR RED, FIELD:—"On the 21st March Mr. A. Dudley, of Ide [near Exeter], brought me a specimen of this little rodent, *Arvicola glareolus* (Schreber) [= *A. pratensis*, Baill. = *A. riparia*, Yar. = *A. rufescens*, De Selys = *A. bicolor*, Fatio,] which had been taken in a mouse-trap in his potato-house. . . . There are no well-authenticated in-

stances of its occurrence in this county. On presenting a small brush dipped in prussic acid to this example I was surprised to see it at once commence to lick it, and it, of course, immediately died. . . ." (W. S. M. D'U. In *Zoologist*, 3rd S. iii. 264, 1879.)

22. "A second specimen of the Red Field or Bank Vole . . . was brought to me on the 7th November by Mr. A. Dudley, of Ide, near Exeter. A careful examination of the molar teeth established the identity of the species, which may now be added with certainty to the Devonshire fauna." (W. S. M. D'U. *Ibid.* 487.)

23. "WHALE, VERTEBRA OF:—In July, 1879, Mr. A. Wintle, of Brixham, presented to the Torquay Natural History Society a dorsal vertebra of Whale taken off the coast of South Devon, in the trawl of a Brixham Trawler. The three spines are much broken, and there are traces of abrasion on the body; in all other respects the specimen is well preserved, and the neural arch is perfect. The colour is almost white, and a few organisms—*balani* and *serpulae*—are attached to it. Each end is, on the whole, slightly convex.

Its dimensions are as follow :

Length	.	.	11.1 inches
Circumference of proximal end	.	.	36.4 "
Do. distal end	.	.	38.1 "
Vertical diameter of proximal end	.	.	11.2 "
Horizontal do. do.	.	.	12.1 "
Vertical diameter of distal end	.	.	11.2 "
Horizontal do. do.	.	.	13.0 "
Length of the dorsal spine	.	.	13.5 "
Do. right lateral spine	.	.	5.0 "
Do. left do.	.	.	5.0 "

The specimen is rather larger than either of those recorded in the Fourth Report (see *Trans. Devon Assoc.* xi. 99–100); but in all probability the three vertebrae are from different parts of the vertebral column of one and the same individual Whale." (W. P.)

24. BITTERN :—The Rev. G. C. Green, writing me from Modbury Vicarage on 31st December, 1879, stated that "within the last few weeks" a Common Bittern [= *Ardea stellaris*, Penn.; = *Botaurus stellaris*, Selby] "had been shot on the Ludbrook, a tributary of the Erme, in the parish of Modbury,

South Devon." He added, "This is the first I have heard of as killed on the Ludbrook, though I once saw one there about 17 or 18 years ago." (W. P.)

25. **CHOUGH, THE CORNISH**:—"Mr. J. C. Hele, of Newton, and I were on Paignton Sands, Torbay, on 8th January, 1880, when we found, lying on the Sands, a portion of a Cornish Chough [= *Coracia gracula*, Linn.], partly eaten, probably by Carrion Crows, of which we saw four on the Sands. Part of the breast and one leg were gone; but in all other respects the specimen was entire, and it was quite fresh. It was about 50 yards west of the new pier, at high-water mark, and had certainly been thrown up by the sea." (F. P.)

The Cornish Chough occurs in the list of Devonshire birds by Mr. Parfitt. (*Trans. Devon Assoc.* viii. 272, 1876.)

26. **DOTTEREL**:—"Towards the end of last May [1879] a trip of Dotterel [= *Charadrius morinellus*, Penn.] visited the neighbourhood of Barnstaple. Three of the birds were shot, and brought into the town. It is only at very long intervals that the Dotterel is seen in the West of England." (M. A. M. In *Zoologist*, 3rd S. iii. 490. 1879.)

Mr. Parfitt remarks of this species: "This bird is now rare in Devon." (*Trans. Devon Assoc.* viii. 281. 1876.)

According to Mr. Yarrell, "It has not been seen more than once or twice in Cornwall, and only occasionally in Devonshire and Dorsetshire." (*Hist. of Brit. Birds*, ii. 392. 1843.)

27. **GOOSANDER ON THE EXE**:—"An adult male *Mergus merganser*, Linn. [= *M. Castor*, Penn. = Goosander = Dunder = Green-headed Goosander] was shot on the river [Exe], near Countess Weir, on the 10th inst. [January, 1880]. This is an extremely rare bird in the western counties in adult plumage. We have in this Museum a fine old male shot near Exeter, about 1840, from the collection of Mr. Robert Cumming; but that and the present specimen are the only adult examples I know as having occurred in Devonshire. immature specimens occur now and then in severe winters. I obtained a young male in 1856, and others have occurred in the neighbourhood at long intervals. . . . The present specimen had hardly completed its moult. . . ." (W. S. M. D'U. In *Zoologist*, 3rd Series, iv. 68. 1880.)

Mr. Parfitt's Catalogue of Devonshire Birds includes this

species, and it is added, "Young birds are met with occasionally late in the autumn." (*Trans. Devon Assoc.* vii. 295. 1876.)

According to Yarrell (*Hist. Brit. Birds*, iii. 293. 1843), "Goosanders in any state are rare visitors to the southern counties of England; but have been killed during hard winters in Cornwall, Devonshire, Dorsetshire, and eastward to Sussex, Kent, and Essex."

28. HAWFINCH:—"During the past winter and this spring [1880] I have had at Christow [near Chudleigh] a few of the rarer birds, such as the Haw Finch [= *Loxia cocothraustes*, Penn.; = *Cocothraustes vulgaris*, Flem.; = *Fringilla cocothraustes*, Jen.; = Haw Grosbeak = Common Grosbeak]." (G. G. B.)

Yarrell says of this species, "It has been obtained occasionally in Dorsetshire, Devonshire, and in the eastern as well as western part of Cornwall." (*Hist. Brit. Birds*, i. 487. 1843.) It will be found in Mr. Parfitt's List of Devonshire Birds. (*Trans. Devon Assoc.* viii. 272. 1876.)

29. HEN AND MOUSE:—The *Western Times* for 19th September, 1879, contained the following paragraph:—"On Thursday, September 11th, Mr. John Pike, gardener, of Alphington [near Exeter] was mowing a lawn at Shillingford, when a field mouse started near him, and a white hen darted after it, pecked at it, and the mouse fled. The fowl caught it again, tossed it up in the air several times as it would toss a snail, and then swallowed it." (W. F.)

I learn from Mr. Pike that the statements in the paragraph are correct; and Mr. E. Langford, of Lower Shillingford, near Exeter, to whom the hen—a white Minorca—belonged, has informed me that, about 10 years ago, he saw another hen belonging to him swallow a "house mouse" that a cat had killed, and that "the tail hung out of her beak some little time after."

30. PHEASANT, A LATE-LAYING:—"The following cutting is from the *North Devon Journal* of October 2nd, 1879:—

'Mr. Dallyn, of Buscombe Farm, in this parish [Challacombe, N.E. Devon], was in his field next to Challacombe Common one day last week when the harvest men were mowing oats, when the scythe passed over the head of a pheasant which was sitting in her

nest. The bird flew away, and Mr. Dallyn counted eight eggs in her nest. This was in the forenoon. After dinner he was again in the field, and saw the bird again fly from her nest, when he counted nine eggs in it; so that she must have laid one in the interval, a very unusual circumstance the week before Michaelmas. He put up a sheaf of corn to protect the bird and her nest, and it is hoped she may hatch her eggs, and rear her brood.'

"I took the precaution of writing to Mr. Dallyn, and he corroborated the circumstance in every particular. The nest, he stated, was discovered on Thursday, the 25th September; and not only Mr. Dallyn, but the men who were working with him in the field, counted the eight eggs, and on disturbing the bird later in the afternoon found that she had laid one egg more. He also informed me that the pheasant soon after being discovered forsook her nest." (G. M. D.)

31. SHOVELLER:—"The Rev. G. C. Green, of Modbury, informed me, on 31st December, 1879, that a few weeks before that date a Shoveller Duck [= *Anas clypeata*, Penn., = *A. rubens* = *A. spathulea*; Flem., = *Rhyncaspis*, Gould; = Red-breasted Shoveler = The Shoveler = Common Shoveler], had been shot by the gardener at Strode, in the parish of Modbury, South Devon." (W. P.)

32. SKUAS:—"Large flights of the birds have appeared in the Channel off the coasts of Devon and Cornwall. Mr. James, of Plymouth, a yachting friend, informs me that when at the entrance of Salcombe Harbour in October [1879] he observed flocks of 'Boatswain' Gulls flying down the river from the direction of Kingsbridge, and afterwards met with a great many off the 'Bolt,' and other headlands on the coast I may here mention that all the smaller species of Skua are commonly called 'Lords' and 'Captains' by the Devon and Cornish fishermen, 'Tom Hurry' being also a local name; but the Great Skua (*Stercorarius catarractes*), now unfortunately so rare on our coast, generally goes by the name of 'Old Hen.'" (J. G., in *Zoologist*, 3rd S. iv. 21. 1880.)

Mr. Parfitt's List of Devonshire Birds includes four species of Skua (*Trans. Devon. Assoc.* viii. 298-9. 1876.)

33. SWIFT, THE ALPINE IN DEVONSHIRE:—"When out shooting along the coast with my brother, on the 4th October, 1876, he shot a young specimen of the Alpine Swift (*Cypselus melba*, Illiger), which was flying with two others in

company with *C. apus*" [= Common Swift], "of which there were about a score . . . I have the skin in my possession." (H. E. R. In *Zoologist*, 3rd Series, iv. 108, 1880.)

I learn by private letter that Mr. Rawson has thought it better not to indicate the exact locality, as he is trying to ascertain if the Alpine Swift does not breed there.

According to Yarrel (*Hist. Brit. Birds*, ii. 239. 1843), five examples of the Alpine, or White-bellied, Swift have been obtained in the British Isles—one in June, 1820, in the Isle of Thanet; one in Norfolk, in September, 1831; one in Ireland, in March, 1833; one in Essex, in July, 1838; and one off Cape Clear, Ireland.

The Alpine Swift is not mentioned in Mr. Parfitt's Catalogue of Devonshire Birds. (*Trans. Devon. Assoc.* viii. 256–302. 1876.)

34. TEAL, AMERICAN GREEN-WINGED:—"My brother, Mr. R. P. Nicholls, purchased from a gunner, on November 23rd, a male specimen of *Querquedula carolinensis*, which he had just shot from an arm of the Kingsbridge Estuary. Although this bird closely resembles the European *Crecca*, Dr. Elliot Coues distinguishes them as follows:—'English Teal (*Crecca*)—No white crescent in front of the wing; long scapulars black externally, creamy internally. American Teal (*carolinensis*)—A conspicuous white crescent on the side of the body, just in front of the bend of the wing; scapulars plain.' This bird agrees in every particular with *carolinensis*, as above described, as also with American skins, with which I have compared it. I am not aware if it has been before noticed to have occurred in Great Britain. Baird, in his 'North American Birds' states it to be accidental in Europe. (H. N. In *Zoologist*, 3rd Series, iv. 70, 1880.)"

35. BOAR-FISH:—"The shore on the western side of Plymouth, on August 12th, was strewn with Boar-fish, *Capros aper*" [= *Zeus aper*, Cuv., = *C. sanglier*, Lace.] "I asked some fishermen, who were drawing a seine for Mackerel, whether they had caught them; but they said that they were caught by the trawlers in the Channel, who in coming into Plymouth threw them overboard when turning out their nets. . . . I should say there were more than a thousand of them. . . . On asking the fishermen, out of curiosity, what they called them, they one and all answered 'Cuckoo-fish.'" (J. G. In *Zoologist*, 3rd Series, iii. 429. October, 1879.)

36. "Since my last note I have had some conversation with Plymouth fishermen on the subject. They tell me that within a few years these fish have swarmed to such an extent as to have become a perfect pest, and that in many instances the trawlers have actually been obliged to change their fishing grounds in order to be out of their way. Indeed such immense numbers often get into the trawls, and so great is their weight, that they are obliged to cut a large hole in the net to let them escape, together with all the more valuable fish they might have taken besides, finding it almost impossible to lift such a great bulk on board without carrying away their gear. . . . It certainly seems remarkable, and worthy of notice, that a Mediterranean fish considered rare not many years since should now appear on our coasts in such countless numbers." (J. G. *Ibid.*, p. 461. November, 1879.)

See "BOAR-FISH," *Trans. Devon. Assoc.* xi. 102. 1879.

37. FOX-SHARK:—"On July 29th a fine Fox Shark (*Carcharias vulpes*)" [= *Vulpecula marina*, Jons., = *Squalus vulpes*, Jen., = *Squale renard*, Lace., = Sea Fox = Sea Ape], "measuring twelve feet in length, and about four in girth, was captured in a herring net off the Start, and brought into Plymouth by some fishermen for exhibition. This fish played great havoc with the net, but appears to have become entangled and captured by the head-rope. . . ." (J. G. In *Zoologist*, 3rd S. iii. 381. September, 1879.)

Mr. Parfitt says of this species: "Taken occasionally on our south coast." (*Trans. Devon Assoc.* vii. 1846, 1875.)

Mr. Couch states that it is "not uncommon on the western and southern coasts of Britain in the summer." (*Hist. of Fishes of Brit. Islands*, i. 39. 1862.)

38. TORPEDO, OR CRAMP RAY:—"Mr. S. Good, photographer, of Seaton [S.E. Devon] . . . kindly sent me a female specimen of the Torpedo, or Cramp Ray" [= *Torpedo narké*, Cuv., = *T. vulgaris*, Jons., = *Raie torpille*, Lace., = *Turpaena* = Numbfish = Electric Ray], "which was taken in a trawl-net by some Beer fishermen on the 28th October [1879]. It measured 2 feet 9½ inches across the back at the widest part. The spiracles were devoid of fringes, and the first dorsal fin was situated nearly entirely behind the roots of the ventrals. The outline of the head in front was straight, being only slightly concave in the centre. The colour was a uniform dark brown

above, and pure white on the underside. There were no traces of spots. It is doubtless the *Torpedo habetans*, Lowe, I examined the electrical organs, and the appearance of the peculiar gelatinous substance of which they are composed strongly reminded me of the egg-clusters of the Squid sometimes thrown upon our shores. I did not perceive that the cells were hexagonal in shape. They more resembled in form the cells in the pulp of a dry-fleshed orange. This fish is so rare on this part of the coast, none having occurred, it is said, for at least thirty years, that its power of giving an electric shock appears to have been unknown to its captors, At all events the first of them that laid hold of it received so severe a practical illustration of this part in its Natural History that his comrades thought that he would have jumped overboard. The specimen has been preserved for this Museum. . . ." (W. S. M. D'U. In *Zoologist*, 3rd Series, iii. 491. December, 1879.)

This species does not appear in Mr. Parfitt's Catalogue of Devonshire Fishes. (*Trans. Devon Assoc.* vii. 119-149. 1875.)

Mr. Couch, who described a specimen taken in Plymouth Sound, says, "Five were noticed in one year in the Mount's Bay, in Cornwall; two or three came under the observation of William P. Cocks, Esq., of Falmouth; and an example was obtained at Weymouth." (*Hist. Fishes Brit. Islands*, i. 129. 1862.)

39. TUNNY, THE LONG-FINNED:—"On 2nd September, 1879, Robert Richards, a fish dealer, at Torquay, brought me a fish which he stated was new to him and to all the Torquay fishermen. Mr. P. H. Gosse, F.R.S., to whom I sent it, identified it as the Long-finned Tunny = *Orycnus alalonga*, Cuv., figured by Couch in his *History of the Fishes of the British Islands*, vol. ii. p. 100, pl. 84. Mr. Richards stated that it was taken in Torbay with Pilchards, Mackerel, and a Fishing-frog (= *Lophius piscatorius*, Linn. = Toad-fish = Frog-fish = Sea-devil = Monk of the fishermen of South Devon and South-east Cornwall), in a seine belonging to Mr. Thomas Lear, of Torquay, on the evening of 1st September, 1879. By careful measurements I found it 38 inches long, from the angle of the projecting under jaw to the angle of the forked tail; 26·5 inches in greatest girth, that is, along a line passing over the dorsal fin; the pectoral fin was 14 inches long; and the extreme points of the tail were 10 inches apart.

"Mr. Couch says that this species 'has only on two or

three occasions been recorded as British. Twice it has been taken in the Mount's Bay, Cornwall . . . and from one of these our figure and description are taken. . . . A third example was obtained at Portland in the middle of March, 1861. . . . Its length was thirty-three inches, and the extreme girth twenty-two inches and a quarter; extent of the pectoral fin eleven inches and a half. The specimen from which we obtain our figure and description was much less than this.' (*Op. cit.* ii., 101. 1863.)

"In his *Catalogue of Devonshire Fishes* (*Trans. Devon. Assoc.*, vii. 138. 1875), Mr. Parfitt thus describes a specimen found in Devonshire waters:—'Taken in the Exe, August 26th, 1865, and recorded in *Annals of Natural History* (3rd Series, xvi. 268–70), by Dr. Scott. . . . Length, from tip of nose to base of caudal fin, 24 ins.; girth round pectoral fin, 19 ins.; girth immediately in front of the second dorsal fin, 15½ ins.'

"It will be seen that the Torbay specimen was larger than either of those recorded by Couch and Scott; and was, in short, the largest British specimen that has been described." (W. P.)

40. BEES:—"For some years past I have kept a hive of bees in the room over my coach-house, the bees having access to the open air through a passage in the floor-board of the hive and the window-sill, the hive being invisible from outside. In the spring of 1880 the bees died, and the hive remained for some weeks untenanted. On the 13th of May a swarm arrived, and took possession of the empty hive. On the 20th of the same month, between 9 and 10 o'clock a.m., my gardener asked me to step into the stable-yard, where, on my arrival, I found a second swarm of bees entering the hive, which had been occupied by the first swarm just one week before. The second swarm arrived from the northward, coming over a hill at the back of the stable, and could not have seen the entrance to the hive until within a couple of yards of it, as it faces the south. The bees in possession offered no resistance to the new arrivals, but received them most amicably. Must we infer from the advent of the second swarm of bees that they had, at some previous time, ascertained that a suitable lodging was at their disposal, and were unaware that, before they required it for occupation, it had been taken possession of by another colony?" (A. R. H.)

41. CEMIOSTOMA LABURNELLA:—"On the morning of 23rd October, 1879, John Mitchell, a gardener, directed my atten-

tion to several long, thin, single threads, resembling those of a spider's web, for which they were at first mistaken, suspended from a Laburnum tree on the St. Mary Church Road, Torquay, and crowded with small active larvæ, about three-eighths of an inch in length, having black heads, but light yellow bodies. Many of the threads were several feet long, and one of them was not less than twelve feet. I found similar threads, with the same kind of occupants, on fourteen Laburnum trees, on the same road. There was no Laburnum without them, and they occurred on no other kind of tree. I placed some of the threads, with the larvæ on them, in a box, and found the next morning that the larvæ had assumed the Chrysalis state, and were covered with cocoons.

"Mr. H. T. Stainton, F.R.S., &c., the well-known Entomologist, who has made the *Tineina* his special study, to whom I sent the foregoing statement, wrote me that the insect was unquestionably *Cemiosstoma laburnella*, a small moth. He added that the phenomenon was of very general occurrence, wherever the insect, which forms greenish blotches in the laburnum leaves, occurs. The full-fed larvæ let themselves down by a silken thread to the ground to seek there a convenient corner for their cocoon, which is freshly spun by the larva *in situ*, the thread by which it descended not being further used. When there are many in close proximity the threads may get intermingled.

"Mr. Stainton recommended strongly that this Memorandum should have a place in this Report; and referred me to his *Natural History of the Tineina* (i. 314) for further information on the subject." (W. P.)

(Signed)	WM. PENGELLY, Hon. Sec. Committee.
(Signed)	GEO. DOE, Chairman, <i>pro tem</i> .

FIFTH REPORT OF THE COMMITTEE ON DEVONSHIRE FOLK-LORE.

FIFTH REPORT of the Committee—consisting of Mr. P. F. S. Amery, Mr. G. Doe, Mr. R. Dymond, Rev. W. Harpley, Mr. P. Q. Karkeek, and Mr. J. Brooking Rowe—for the purpose of collecting notes on Devonshire Folk-Lore.

Edited by G. DOE, Honorary Secretary of the Committee.

(Read at Totnes, July, 1880.)

THE notes on Devonshire Folk-Lore, collected since the meeting of the Association at Ilfracombe, have, as in the last two reports, been arranged, as far as possible, under the heads of—1, Stories and Traditions; 2, Charms, or Medical Superstitions; 3, Witchcraft; 4, General Folk-Lore; 5, Popular Beliefs and Sayings, the contributor's name being appended to each note.

A copy of the last report was, on the suggestion of Mr. R. Dymond, sent to the Secretary of the Folk-Lore Society, London, and duly acknowledged.

W. HARPLEY, Chairman.
GEORGE DOE, Hon. Sec.

I. STORIES AND TRADITIONS.

Ghosts of the Parson, his Chariot, and his Horses.—"In the south of Devon, some eighteen or twenty years ago, a reverend gentleman, of large landed property, held a small benefice in his immediate neighbourhood, for the purpose of evading residence in another quarter. He was accustomed to perform the duty every Sunday, and was conveyed to the church in his chariot through one of those narrow shady lanes, for which that county was then so justly famed. He died, and his remains were consigned to the vault in the church of the above-mentioned benefice, with much pomp

and ceremony, and followed by a large procession of friends, tenants, and the surrounding neighbourhood. But his spirit was not supposed to rest in peace. Villagers returning from their labours had been terrified by the sound of carriage wheels in the shady lanes, and one had even seen the chariot itself drawn by headless horses. The rumour spread, till it was confidently asserted in the cider shop that 'twelve parsons' had been convened to lay the spirit in the Red-Sea. Still the lane was believed to be haunted; and on investigating the reason why the spell had not taken effect, it was conjectured that, as one of the twelve parsons had been the intimate friend of the deceased—as he *knewed the trick*—he would communicate it to him, and so render it abortive. *That* parson was, therefore, struck out of the list; and the vicar of an adjoining parish, lately come into residence, from 'Lunnun town,' did it all *hisself*; and neither chariot nor horses *was ever knowed to walk again*. This superstition was current under the immediate knowledge of the writer of this anecdote."

Copied by W. Pengelly, from "On the Ancient British, Roman, and Saxon Antiquities and Folk-Lore of Worcestershire." By Jabez Allies, Esq., F.S.A., Second Edition, 1850, pp. 464-5.

"*The Black Dog that Hunts the Moor.*"—A few years ago two ladies from the North of England made a tour of pleasure into the county of Devon. In their journeyings they rode on the outside of the coach from Okehampton to Tavistock, in order that they might see some portion of the far-famed Dartmoor.

Twilight came on whilst they were crossing the moor. Suddenly their attention was aroused by the agitation and excitement of the coachman, who in terror exclaimed, "There, there! do you see that?" On being questioned as to what he meant, he pointed with his whip to some creature that was running along by the side of his horses, saying, "There's the black dog that hunts the moor."

Terrified at the sight, he lashed his horses into a gallop in order to escape from the weird "black dog that hunts the moor," which suddenly vanished.

I congratulated my lady friends on their good fortune in having been thus made acquainted with a bit of the "Folk-Lore" of Devon.

J. F. WILKEY.

Braunton Church.—A correspondent gives in the *North*

Devon Herald, of September 26th, 1878, a description of Braunton, from which I extract the following :

"I visited the Chapel Hill, which is situated near Braunton. We are told that this was the spot where the Brauntonians intended to build their original church, but as fast as the building rose in the day it fell by night ; while another story has it that the church was completed, and service held in it."

Then comes a quotation from a piece of poetry handed to the contributor by an old resident, which, being far from meritorious both in sense and grammar, is scarcely worth insertion. It records that the builders of the church at length heard a "voice in the air" directing them to desist from their work and "search for the pig in the mire," though the poet does not condescend to say what was to be done on the discovery of the animal. The writer of the article then continues—

"The rhyme goes on to say that any one paying a visit to Braunton may at the present time see engraved on the roof of the church six pigs and a sow. The ruins themselves can be easily entered from Silver Street, and the ground adjoining belongs to Mr. G. P. Hartnoll. The poor of Braunton have, I think, some little claim on it, at least a certain portion of the rental goes towards the providing of a Christmas dinner for them."

G. M. DOE.

II. CHARMS OR MEDICAL SUPERSTITIONS.

To Prevent Chilblains.—One child out of a family of four seems quite free from chilblains. The reason, I am informed, is, that the child's nurse, a woman from Widecombe, washed the baby's feet in water melted from the first snow that fell after it was born.

P. F. S. AMERY.

A Cure for Fits.—Two or three cases of the following charm have come to my notice during the present year at Ashburton, and I find it to be a common practice : A person afflicted with fits must beg thirty pence from as many young people of the opposite sex. These another must change for half-a-crown, the silver to be made into a ring without payment. This ring, if constantly worn, will quite cure the fits. May not the mental occupation and anxiety experienced in following out the process have something to do with the cure.

P. F. S. AMERY.

Strange Cures.—To stop bleeding, fresh pigs' dung is used occasionally in my neighbourhood. At Mamhead a farmer's

son having sustained a severe incised wound in the palm of the hand, the father followed a pig about the farm-yard till the animal parted with sufficient dressing. The son's hand was then immediately covered with this, and wrapped up in a cloth.

A farmer's son residing at Exminster had an attack of bleeding at the nose. The father laid the boy on his back, and filled his nostrils with the unsavoury medicament. A cure was in both cases effected.

G. PYCROFT.

Charm for the Cure of Shingles, scientifically called Herpes zoster, popularly called in Devonshire "the Girdings."—For a male: Take a black female cat, cut either ear, or the end of the tail, and collect the blood in a saucer. Then take a hen, cut the comb or wattles, and squeeze out the blood into the same saucer. Next take a woman who is suckling a female child, squeeze out some drops of her milk into the saucer, and mix.

For a female: Proceed as before, substituting a tom cat, a cock, and a woman suckling a male child, and mix as before.

The lotion thus prepared is to be "struck" over the eruption, and a dressing of "raw head" applied afterwards.

This remedy is always practised in Kenton, and its neighbourhood. I have known it used in a score of cases at least, notably in the families of two beneficed clergymen.

G. PYCROFT.

Superstitious Cure for King's Evil.—In the *Western Morning News*, of July 8th, 1879, appeared particulars of a horrible murder and suicide at Plymouth, with an account of the inquest on the bodies. It further states that just as the jury left the room two elderly ladies, having with them a little boy with his head bandaged, presented themselves in court. One of them, Mrs. B——, a resident of Plymouth, addressing the coroner, said her friend Mrs. J—— was the mother of the lad, who was afflicted with *king's evil*, and she had been told by an old woman that if the poor boy were "struck" by a person who had committed suicide it would effect a perfect cure, and they therefore wished to obtain permission to make a trial of the man who had committed suicide that morning, and then to leave the boy in the hands of God.

The coroner asked if she had ever heard of a cure being effected in that way before.

Mrs. B—— replied that she knew of a woman who had

been restored to health after such an operation; but of course she could not say whether it was the hand of Almighty God, or not.

The coroner replied that the jury having returned their verdict, the body was out of his hands. He had been coroner ten years, and had never heard of such an application before.

The applicants then left the court. P. F. S. AMERY.

Similar communications have been received from Mr. Pengelly and Mr. Brooking Rowe. G. D.

Test for King's Evil.—A daughter of a small farmer at Ashburton suffered for a long time from a diseased leg, which was thought to be the *king's evil*. To test whether it were so or not a living *angle-twitch* (earthworm) brought from the garden was placed on the sore. As the worm received no harm it was decided not to be that malady; for, I am informed, had it been king's evil it would have immediately shrivelled up. P. F. S. AMERY.

Touching a Corpse.—The practice of touching a corpse prevails very generally in this neighbourhood. On December 22nd, 1879, I was present at the *post-mortem* examination of Mrs. West, who had been shot at Wear Gifford by her husband. Before the place was locked up the two servants were admitted to see their dead mistress. As they were leaving the room one of them said to the other, "Touch her," upon which she went back, and put her hand on the corpse. After a deal of pressing on my part the girl told me that her object in touching the body was "to prevent dreaming about it, or seeing it again." G. M. DOE.

Cure for a "Sty."—The following was communicated to me by a gentleman of Dolton, who obtained it from an old man of the village some years ago: A stick used by washer-women for stirring the garments whilst boiling, technically called a "pot-stick," is to be put through a gold wedding ring, and the operator holding the ring in one hand "strikes" the eye affected by pushing the stick with his other hand, repeating the following lines:

"Pot-ee, pot-ee,
Why dist pote me?
To pote the wan out of thine 'ee."

I should imagine, however, that the correct way of reciting the incantation would be for the *patient* to say the first two lines, and the *operator* to answer him in the last. In the

third report of the Folk-Lore Committee, read at Paignton, Mr. Pengelly gives a cure for the "sty" by a widow "striking" it with her wedding ring; but there being no mention of the stick, nor of the incantation, I have thought the foregoing not inadmissible.

G. M. DOE.

III. WITCHCRAFT.

To Render a Witch Powerless.—Procure some maiden nails from a blacksmith (maiden nails are those freshly made from bar-iron, and must never have been used; they must not be allowed to fall to or be put on the ground, or their virtue is lost). Drive them into the threshold of the witch's door, and she will lose her power on crossing it; or watch her walking along the road, mark the spot where she has placed her foot, and drive a maiden nail into it. Her power of mischief for the day is thus taken from her. This charm has been practised within the last few years at Kenton.

GEORGE PYCROFT.

IV. GENERAL FOLK-LORE.

Knocking Old People on the Head.—I have frequently heard old people, who in their time had lived active lives, remark when helplessly laid aside that *their friends had better knock them on the head*. Why such a mode of death is spoken of seems explained by an ancient Scandinavian custom, which may have lingered in tradition to the present day. Among the Scandinavians it was usual for those mighty warriors, whom battle and accident had spared, when they became oppressed with the infirmities of old age, to seat themselves on the green mound of Odin, with their kinsmen standing around in a ring. The strongest of the race then struck the veteran down with the "kith-club," and he passed away to Valhalla.

P. F. S. AMERY.

Shoulder Feasting.—An old lady remarked shortly before her death that she would have no "*shoulder feast*" at her funeral like her grandfather had at his, when all the parish feasted. I find on enquiry that it was entertaining persons not relatives at her funeral she meant.

P. F. S. AMERY.

Sun shining on Christmas-day.—A lady residing at Tarrington informed me in the beginning of this year that she had often been told that when the sun does not shine on Christmas day there will be little or no fruit in the ensuing year.

G. M. DOE.

Cease, rude Boreas.—I remember making many years ago one of a party on pleasure bent, up the river Tamar. After a pleasant picnic on its banks we returned in our boat towards the port of embarkation. The wind which had hitherto favoured us, now began to freshen, and I in my ignorance began to hum "*Cease, rude Boreas, blustering railer,*" when the old boatman in a tone of authority cried out, "Stop that, stop that, you mustn't sing that tune; if you do we shall soon have a storm." I was, of course, unwilling to raise a storm, either from the breath of old Boreas or the old boatman; and so we reached in safety our desired haven. J. F. WILKEY.

"STING-NETTLE DAY: THE THIRD OF MAY."

To the Editor of *The Daily Western Times*.

SIR,—A gentleman has very kindly communicated to me a curious and, I believe, a very ancient custom, which he observed at Bovey Tracey on Monday, May 3rd. All the children, so far as he saw, were provided with a nettle, or bunch of nettles, and were flogging each other with them. He inquired the reason of such demonstration, and was informed that it was "sting-nettle day: the third of May."

I think I have a clue to this curious custom, but at the same time should be glad if any kind reader could throw any additional light on what I believe to have been a custom in the middle or dark ages.

May 4th, 1880.

I am, Sir, yours truly,

EDWARD PARFITT.

"STING-NETTLE DAY: THE THIRD OF MAY."

To the Editor of *The Daily Western Times*.

SIR,—My friend, Mr. Parfitt, will probably be interested in learning that the following "saying" is well-known amongst the children of the labouring classes at Torquay:

The First of May is "May-doll" day;
The Second of May is kissing day;
The Third of May is sting-nettle day.

My informant is a servant girl, 20 years of age, who has always lived at Torquay, but whose parents are natives of North Tawton. She has never seen sting-nettles used on the third of May. The first line of the "saying" points to an existing fact. The "May-doll" was in great force here on the 1st instant, but so far as this district is concerned the second and third lines are *survivals* merely.

Torquay, 7th May, 1880.

W. PENGELLY.

The mother of the servant mentioned above has since informed me that, in her girlhood, the practice of striking persons with nettles on 3rd May was very prevalent at North Tawton, and that her own arms have frequently been blistered all over in consequence.

Hone mentions the custom, but places it on May-day Eve. "Another custom," he says, "prevalent on May-eve is the painful and mischievous one of stinging with nettles. In the south of Ireland it is the common practice for school-boys on that day to consider themselves privileged to run wildly about with a bunch of nettles, striking at the face and hands of their companions, or of such other persons as they think they may venture to assault with impunity." (*The Every-day Book*, vol. i. p. 594. 1826.)

Sting-nettle Day.—A curious and undoubtedly a very ancient custom is celebrated annually by the children of Bovey Tracey. The custom has, I believe, undergone very considerable modification, if I am right in its interpretation.

On the third of May, this year (1880), W. B.—, Esq., was passing through the village, and was struck with the peculiarity of all the children being provided with a nettle, or bunch of nettles, with which they were flogging each other. Having never seen the like before, Mr. B— thought there must be some meaning in this demonstration, and on enquiring of some of the children, he was informed that it was "Sting-nettle Day." This, however, did not explain the meaning of the strange custom, and when he returned he asked me if I could throw any light upon it, or give him a clue to its meaning. My friend, Mr. Pengelly, has very kindly pointed out in the *Western Times*, in answer to a query I inserted in the same publication as to its meaning, that the custom survives in name only in the Torquay district. I cannot find in any work a direct reference to this holiday as it is kept by the children of Bovey Tracey; at the same time, I believe that this, as it is now practised, is only a modification of the following. It is from Green's *Quip for an Upstart Courtier*, 4to, London, 1620.

"Questioning, says he, why these women were so cholericke, he pointed to a bush of nettles. Marry, quoth he, they have severally watered this bush, and the virtue of them is to force a woman that has done so to be peevish for a whole day, and as waspish as if she had been stung in the brow with a hornet." "Perhaps," writes Brand (*Popular Antiquities*, vol. ii. p. 120), "the origin of this well-known

superstitious observation must be referred to a curious method of detecting the loss of female honour noticed in *Naturall and Artificall Conclusions*, 8vo. By Thomas Hill. London, 1650. Art. lxxix.

"It may be necessary here to deprecate the frowns of our fair countrywomen of the eighteenth century on reading the simple processes of their ancestors to detect the loss of female honour. Yet who knows what powerful auxiliaries even these ridiculous superstitions may have proved in the dark ages, to what is of such consequence to the happiness of society—I mean the virtue of women?"

Another version of this application of the nettle to tell a certain story as to honour was practised in Herefordshire, according to Hone (*Every-day Book*, vol. i, p. 565). "On May-day, soon after three o'clock in the morning, the towns-people parade the town singing the 'Mayer's Song.' They carry in their hands large branches of may, and they affix a branch either upon or at the side of the doors of nearly every respectable house in the town. Where there are knockers they place bunches within the handles. The larger the branch is that is placed at the door the more honourable to the house, or rather to the servants of the house. If in the course of the year a servant has given offence to any of the mayers, then, instead of a branch of may, a branch of elder with a bunch of nettles is affixed to her door. This is considered a great disgrace, and the unfortunate subject of it is exposed to the jeers of her rivals. On May morning, therefore, the girls look with some anxiety for their may branch, and rise early to ascertain their good or ill fortune."

It would seem from the paucity of writing on this subject that it was of not much interest, and I should premise from my having received no further communications to my enquiries through the press that the custom herein described is limited to the locality of Bovey Tracey. But be this so or not, the custom is a curious one, and ought to be preserved in our *Transactions*.

EDWARD PARFITT.

I add the following letter, which appeared in the *Western Times* of 9th June, 1880:

STING-NETTLES.

To the Editor of *The Daily Western Times*.

SIR,—I am very late in seeing a letter in your paper for last May 7th, 1880, in which a gentleman, Edward Parfitt, I think,

asks the origin of the children at South Bovey having on 3rd May bunches of sting-nettles, and beating each other. No doubt it has been ably answered; and perhaps in notes to correspondents in your next issue you would kindly tell me the date of the paper in which, if it was answered, I should see it. This is what Brewer, in his excellent "Phrase and Fable" book, says (quoting from Camden), "That the Romans originally brought the seed of sting-nettles to Britain to whip themselves with." They swarm in this cold country. No doubt if not the sole origin, it is one of them, and may be the reason of the Boveyites using sting-nettles in the same way. Should you like to insert this in your paper you can do so, should this not be the solution given, if replied to previously, which I have no doubt it has been; but I thought I would venture my say.

Faithfully yours,

STING-NETTLE.

Old Inn, Widecombe, Ashburton, June 7th, 1880.

G. DOE.

Oak-Apple Day.—On taking a seat in a railway carriage at Torre, Torquay, on 29th May, 1880, I remarked to my fellow-travellers, all residents at Torquay, "I see there are many people wearing oak-leaves to-day."

"Yes," said a lady, "my little boy went off early to gather sting-nettles. I believe all his school-mates are gone to gather them."

On which a gentleman remarked, "I saw a good many boys near my house, picking sting-nettles, when I left to come here."

"Sting-nettles!" said I. "What for?"

"Oh, to sting those that don't wear oak!"

"Is that usual about Torquay?"

"Yes, all the children do it."

I had lived at Torquay upwards of forty years, but this fact was new to me.

About an hour afterwards, I met several persons in the parish of Ilsington, South Devon, wearing oak-leaves and oak-apples, and wishing to ascertain whether the origin of the badge was generally known, I said to an intelligent-looking farm-labourer, about 21 years of age, "Why do you wear oak-leaves?"

"'Tis oak-apple day."

"What *is* oak-apple day?"

"The twenty-ninth of May."

"But why is that day called oak-apple day?"

"I'm sure I don't know, sir."

W. PENGELLY.

V. POPULAR BELIEFS AND SAYINGS.

Colour of the Planet Mars during a War.—A lady about 35 years of age, resident at Torquay from infancy, said to me to-day, "Why does Mars assume a more ruddy hue during the time of a war?" On my expressing a doubt as to the truth of the alleged phenomenon, she assured me that it was very prevalently believed in Devonshire and elsewhere, and that she had been impressed with its truth from her own observations of Mars during the late Franco-German war. In this she was supported by three younger ladies, who were present.

WM. PENGELLY.

Candles, Candlesticks, and Marriages.—A nurse, about 50 years of age, a native of Cornwall, but long resident in South Devon, coming into a room in which I was sitting, at Torquay, in the summer of 1879, remarked, "There'll be a marriage," and, on being questioned, directed attention to the following facts:—There were four candles burning on the same table; the candlesticks stood at the angles of a square, and those at the ends of one of the diagonals were a pair, in all respects alike; this was also the fact as regards those at the ends of the other diagonal, but the two pairs were unlike one another. Moreover, the candles in one pair were of the same height, but much shorter than those in the other pair, which were also equally high. In short, the candles, like the candlesticks, formed two distinct pairs; and the entire group was symmetrically arranged. Such an arrangement the nurse assured me was commonly held to foretell the marriage of one of the company.

A. PENGELLY.

Drunk as Blaizes.—This expression is frequently heard at Ashburton. "In *Notes and Queries* (6th S. 1, p. 434) the similar expression of 'Drunk as Blaizers' is attributed to a feast of woolcombers, in honour of their patron St. Blaize; those who took part in the procession were called 'Blaizers,' and the expression originated in the convivialities common on that occasion."

The old mode of hand-combing wool necessitated a fire to heat the combs. The stoves, formed of clay, were called "comb pots," in which charcoal or culm was burned; they had no flue, and stood in the shop; usually there was a pot to every four combers. The atmosphere, therefore, of a comb shop was very hot and dry, causing continual thirst. Frequently the men kept a hogshead of cider within reach;

they were notorious drinkers, and so a "blaize" or comber was a proverbial toper. In processions the combers carried a banner of Bishop Blaize in full canonicals, with a comb in his hand.

P. F. S. AMERY.

To Jump (Shake) One's Life Out.—I heard a farmer, speaking of a neighbour's dog which had worried his flock, say, "If I had caught 'en I would have *jumped his life out*." During the summer of 1879, Miss Seymour, who kept a Home for Girls at Shaldon, was fined by the magistrates for assaulting an inmate called Kevern, who stated in her evidence that the lady on one occasion threatened "*to jump her life out*." Here are two persons of very different social standing making use of the same expression.

P. F. S. AMERY.

To Judas a Person.—A respectable farmer's wife, about sixty years of age, living near Totnes, speaking of an attempt which had been made to take away the license from a little wayside inn, said of a certain person, "He *Judassed* her (the hostess) to her face, but all the time was injuring her behind her back."

P. F. S. AMERY.

"So Judas kissed his master,
And cried—All hail! when as he meant—all harm."

SHAKESPEARE—3 *Henry VI.*, act 5, scene 7.

G. DOE.

Rent Rocks on Dartmoor.—The numerous blocks of granite which appear to be split asunder by some violent action, are said by the moormen to have been riven in that manner by the earthquake which occurred at our Saviour's crucifixion.

P. F. S. AMERY.

Wheelbarrow News=Stale News.—A young man, a native of Bickington, aged thirty, told me last December that something I said was "*wheelbarrow news*." Fish hawked about in a wheelbarrow are assumed to be stale, hence the saying.

P. F. S. AMERY.

Time for Cutting Alder.—On Dartmoor alder is much used for tool handles, &c.; it grows plentifully on the banks of streams. Old John French, of Dennabridge Pound, who assisted to quarry the stone when the Dartmoor War Prisons were first built, used to say—

"When the 'aller' (alder) leaf is as big as a penny,
The stick will wear as tough as any."

P. F. S. AMERY.

Tea Drinking Injurious.—I have frequently noticed in the harvest-field, where tea is usually provided, that men will take a drink of cider after tea, before commencing work. I once remarked the fact to a Lustleigh farmer, who informed me that tea was considered injurious if not washed down, hence the saying—

“If you want to live for ever ;
You must wash the tea off your liver.”

How about modern kettle-drums ? P. F. S. AMERY.

Loaves and Life.—A domestic servant,* about twenty years of age, who has always resided at Torquay, said, when cutting bread and butter, “There! I havn’t cut the loaf straight! I shall have a crooked [=unfortunate] life!” L. PENGELLY, jun.

Burning Ears.—A domestic servant told me to-day that “if your left ear burns in the middle of the day it denotes that some one is speaking ill of you, but if you cut, at once, a small piece off the end of your apron string the person speaking ill of you will bite his or her tongue, and no ill effects will occur to you.” L. PENGELLY, jun.

Sweeping and Luck.—A domestic servant informed me to-day that to sweep dirt or dust from any room through the doorway to the exterior of a house, or to take any dusty article out of doors and there shake it, is to sweep or shake luck away. The only safe course is to sweep or shake into the fire place. L. PENGELLY, jun.

Tea-kettles and Marriages.—A domestic servant assured me to-day that whoever puts a tea-kettle, without its cover, on the fire, will not be married during the twelvemonths next following. L. PENGELLY, jun.

Bleeding and Temper.—I am told by a domestic servant that if a person, who cuts himself or herself, bleed freely, it indicates that his or her temper is bad. L. PENGELLY, jun.

Loaves and Family Partings.—A domestic servant has just told me that if a loaf of bread be found to have holes in it, the family by whom the said loaf was made will have a parting shortly. L. PENGELLY, jun.

* This servant is the same as mentioned in the nine following notes.

Full Moon and Hair.—A domestic servant said to me to-day, "We ought to have cut our hair yesterday."

"Why!"

"Because 'twas full moon."

"Is it lucky to cut it at full moon?"

"Oh, it makes the hair grow thick!"

L. PENGELLY, jun.

Sayings.—A domestic servant, speaking to me of a person who was covetous, said, "But that runs in the blood, like wooden legs. Her sister's covetchus [= covetous] too."

L. PENGELLY.

A servant girl, wishing to convey the idea that an event spoken of was not likely to occur, said, "That'll happen when the seven stars come to fourteen." L. PENGELLY, jun.

A servant girl, describing a person rather deficient in intellect, said, "Oh, he's threeha'pence short of a shilling!"

HESTER PENGELLY.

Black Pins and Dressmaking.—A dressmaker, about 30 years old, born and resident at Torquay, when "trying on" or fitting on a new dress to a customer, declined to use a black pin, remarking that were she to use it the dress would certainly not fit.

L. PENGELLY, jun.

Luck-money.—It is usual on selling cattle and sheep, and their being paid for, to return a shilling or some other coin to the buyer as "luck-money." I have often seen him spit on the coin before putting it into his pocket; and I am told that this is still done, and that persons selling poultry, &c., in the market will spit upon the first money that they take in the day "for luck." Also that some, when they first see the new moon, take out their money and spit on it for the same cause.

W. H. GAMLEN.

Bees.—The wife of a farmer residing at Shebbear gave me the following piece of information: A swarm of bees belonging to her had settled on a raspberry pole. Instead of hiving the swarm she let the bees remain until they flew away. On my asking her why she did this, she informed me that if she had not let them be, but had put them into a hive, there would have been a death in the family within the next twelve months. She seemed greatly concerned on

learning that I had "shaken" a swarm which had pitched on the support of the hive. Though I was not able at the time to refute her statement, I can do so now, more than twelve months having elapsed without a death. G. M. DOE.

Plants in Mourning.—A gentleman of Dolton informed me the other day that he recollected, whilst staying a number of years ago at the house of a relative at Exbourne, that all the window-plants, on the occasion of a death in the family, had small pieces of crape placed on them. G. M. DOE.

Weather Sayings.—October generally a dry month. A farm labourer tells me that his old master used to remark—

"Never knew an October "eat" (yet)
When could 'en burn beet."

A mild winter after a cold October—

"Ice in October to bear up a duck,
The winter will be all of a muck."

Relation between March and May—

"As many fogs in March,
So many frosts in May."

Relation between Christmas-day and May—

"Hours of sun on Christmas-day,
So many frosts in month of May."

P. F. S. AMERY.

FOURTH REPORT OF THE COMMITTEE ON DEVONSHIRE CELEBRITIES.

FOURTH REPORT of the Committee—consisting of Mr. R. Dymond, Rev. Treasurer Hawker (Secretary), Mr. P. Q. Karkeek, and Mr. R. N. Worth—for the purpose of compiling a list of deceased Devonshire Celebrities, as well as an Index of the entire Bibliography having reference to them; that the list consist exclusively of Celebrities born in Devonshire.

Edited by Rev. TREASURER HAWKER, Hon. Sec. of the Committee.

Read at Totnes, July, 1880.

THE resolution passed in reference to Devonshire Celebrities, at the meeting of the Association, at Ilfracombe, was valuable as an official definition of the Committee's work.

It confines the list for the present specifically to those born in the county, and enlarges considerably the Committee's work by the direction to compile an "index of the entire bibliography having reference to them, i.e.—an index of all publications, other than newspapers, containing statements, however brief, calculated to throw light on the history, character and writings of all celebrities born in Devonshire."

This task, not a light one, has been ably begun and much lessened by the labour which Mr. Worth bestowed on the first list; to whom also the credit of starting efficiently a valuable treasury of county biography is largely due.

It is obvious that important additions may be made from time to time, not only to the original list of celebrities, but to the bibliographical notices, such as appeared in skeleton in the first report.

The Committee will be thankful for help in this matter from members of the Association, or indeed from those outside who may take an interest in the subject.

At best, what is accomplished in so small a compass can be no more than suggestions and guidance for fuller work, as a

sort of note-book, in which materials are collected for complete and polished narrative.

If the patient labour of the present members produces at some future date a Tacitus, who will give to the world sixteen books of Annals of Devonshire Celebrities, like the Annals of the Roman Historian, one object of the Association will have been attained, for—

“There is
One great society alone on earth :
The noble Living, and the noble Dead.”
WORDSWORTH'S *Prelude*, xi. 255.

The time for embracing in the list those, who, though not born in Devonshire, passed part of their lives in it, and were celebrities, will probably be indicated with sufficient clearness by the absence of information of further names under the original restriction.

ROBERT DYMOND, Chairman.
J. MANLEY HAWKER, Hon. Sec.

Among the additions and errata, &c., the following are proposed.

Barclay, Alexander ; Prebendary of Ottery.

Browne, W. ; Poet, *d* at Ottery.

After Bidlake to add “Bampton Lecturer, Oxford ; first report, p. 105.”

- . After Bowring, Sir John, &c., first report, p. 105, to add “*Autobiographical Recollections*, by Lewin B. Bowring, Esq., C.B., 1877 ; *Westminster Review* ; *Political Economy* ; *Ballads and Traditions of Northern Europe* ; *Language and Literature of the Magyars* ; *Foreign Quarterly* ; *The Runes of Finland* ; *Westminster Review*, xiv. ; *Language and Literature of Holland*.”

Brockedon, William ; referred to in *Blewitt's Panorama of Torquay*, 1832 ; *Imp. Dict. Un. Biog.* ; wrote *Passes of the Alps*, 1828-9 ; *Journal of Excursions in the Alps*, 1833 ; *Life and Works of Lord Byron* ; *Finden's Road Book from London to Naples*, 1835 ; *Italy — Classical, Historical, Picturesque*, 1852-3 ; *History and Condition of Italy*, 1846.

Furneaux, Philip ; 3rd report, vol. xi. p. 114, referred to in *Bunhill Memorials*, p. 54 ; *Lyson's Gentlemen's Magazine* ; wrote *Letters to Blackstone on Toleration*, published 1771 ; *Essay on Toleration*, 1778 ; *Sermons*, 1755-8.

Fulford, Francis, D.D. ; fellow of Exon. College, Oxford ; Bishop of Montreal, 1850 ; Metropolitan of Canada, 1860 ; second son of Baldwin Fulford, Esq., of Fulford ; *b* at Sidmouth, 1803, educated at Blundell's School, Tiverton ; *d* at Montreal, 1868.

- Hieron, Samuel; *b* 1573, *d* 1617 or 1618; referred to in *Brook's Lives of the Puritans*, vol. ii. p. 273; *Palmer's Nonconformists' Memorial*, vol. i. p. 370; wrote Volumes of Sermons, published 1624.
- Kennicott, Benjamin; *b* 1718, *d* 1783; *Trans. Devon Assoc.*, vol. x., 215; E. Windeatt. Referred to in *Blewitt's Panorama of Torquay*, 1832; *Imp. Dict. of Universal Biography*, vol. iii. p. 82; Rev. H. T. Ellacombe's *Church Bells of Devon*; wrote *Dissertations, Sermons, Poems, State of Text of Old Testament*, 1753, 2nd vol. 1760; *Critical Remarks on Psalms*, 42, &c.; *Dissertation on Samaritan Pentateuch, Vetus Testamentum Hebraicum cum variis lectionibus*, vol. i. 1776, vol. ii. 1780.
- King, Richard, J.; wrote *Handbooks of Cathedrals; Sketches and Studies*.
- Lye, Sir Edward; *b* 1553, *d* 1625; *Totnes*, vol. ix. p. 114.
- Lye, Rev. Edward; referred to in *Enclop. Brit.*; *Annual Register*, 1801; *Imp. Dictionary Un. Biography*, p. 251; *Aikin's Gen. Biog.*, vol. i.; *Life annexed to Anglo-Saxon and Gothic Dictionary*, by Manning; wrote *Etymologicum Anglicanum of Francis Junius*, with Anglo-Saxon Grammar prefixed; *Gothic Gospels with Gothic Grammar prefixed*; *Anglo-Saxon and Gothic Dictionary*, published 1772.
- Lake, Edward, D.D.; a minister's son, *b* 1643, at Exeter; Prebendary, 1675; Archdeacon of Exeter, 1676; Rector of united parishes of St. Mary Hill and St. Andrew Hubbard in London; scholar of Wadham, Oxford, 1659; wrote *Officium Eucharisticum*, published by H. Parker, 1843, reached thirty-first edition; *d* 1675.
- Locke, Matthew; composed music in "Macbeth."
- Rowe, Nicholas; translator of *Lucan*; said to have been born at Lamerton, near Tavistock; of which parish of Lamerton his father was vicar.

The reappointment of the Committee, consisting of Messrs. Robert Dymond, R. N. Worth, Edward Windeatt, P. Q. Karkeek, Sir John H. Kennaway, Bart., M.P., and Rev. Treasurer Hawker is recommended, the Rev. Treasurer Hawker to be Hon. Sec.

SECOND REPORT OF THE COMMITTEE ON WORKS OF ART IN DEVONSHIRE.

SECOND REPORT of the Committee—consisting of Messrs. R. Dymond (Secretary), R. N. Worth, and Rev. Treasurer Hawker—on Works of Art in Devonshire. The Committee desire to add to their number Messrs. Edward Windeatt and J. G. Templer.

(Read at Totnes, July, 1880.)

IN their First Report, presented at Paignton in 1878, the Committee explained the great difficulty attending the collection of accurate information concerning the works of art scattered throughout the county. That difficulty has since been greatly enhanced by the irreparable loss of their valued colleague and Secretary, the late Mr. Richard John King. The present members of the Committee can only undertake, if appointed, to note from time to time such works of art as come before their notice. It may be well for the machinery of a Committee to exist, even if it is not always put in motion.

It may be useful and interesting for future members of the Association to know that there are fine specimens of Romney at Indio, Bovey Tracey, belonging to C. A. Bentinck, Esq.; curious family pictures of the Cromwells at The Lodge, Bishopsteignton, Mrs. Huddleston's; and portraits of thirteen Bishops of Exeter at the Palace, Exeter, a list of whom is subjoined.

1. Offspring Blackall. 1708–1716. Style of Dahl.
2. Launcelot Blackburn. 1717–1724. Style of Seeman.
3. Stephen Weston. 1724–1742. Painted by Hudson,
4. John Gauden. 1660–1662. A head.
5. George Lavington. 1747–1762.
6. Hon. Fred. Keppel, D.D., 1762–1777, bearing the badge of Registrar of the Garter. He was Dean of Windsor, 1765–1778.
7. John Fisher, 1803–1807, represented as Bishop of

Salisbury and Chancellor of the Garter, which latter he became 18th July, 1807. He died May, 1825.

8. Seth Ward. 1662-1667. Coat of arms impaling See of Exeter.

9. Antony Sparrow. 1667-1676. Ditto.

10. Sir Jonathan Trelawney. 1689-1707.

11. Uncertain. Either John Ross or Courtenay. Painted by Abbott, who died in 1803.

12. Henry Phillpotts.

13. William Carey. 1820-1830.

J. MANLEY HAWKER, Chairman.

ROBERT DYMOND, Hon. Sec.

SECOND REPORT OF THE BARROW COMMITTEE.

SECOND REPORT of the Committee—consisting of Mr. C. Spence Bate, Mr. G. Doe, Mr. P. O. Hutchinson, Mr. E. Parfitt, Mr. W. Pengelly, Mr. J. Brooking Rowe, and Mr. R. N. Worth (Secretary)—to collect and record facts relating to Barrows in Devonshire, exclusive of Dartmoor, and to take steps where possible for their investigation.

Edited by R. N. WORTH, F.G.S., Honorary Secretary.

(Read at Totnes, July, 1886.)

YOUR Committee beg to report that, having placed upon record the Barrow Literature of the County, so far as it could be ascertained, they resolved that the next step to be taken by them was the collection of facts concerning the Barrows that still exist, and such investigations as had not hitherto been permanently recorded. At the request of the Committee, therefore, Mr. P. O. Hutchinson kindly undertook to prepare a report on the Barrows in the neighbourhood of Sidmouth, and the Association is hence indebted to him for an exceedingly valuable statement of original enquiry and research, thoroughly exhaustive of the district under review, the value of which is greatly enhanced by the admirable map and illustrations which accompany the text. The Committee hope in time to be able to extend their enquiries on the lines so well laid down by Mr. Hutchinson, to the whole of that part of Devon which lies within their sphere of operation.

The Committee are also indebted to two others of their number, Mr. Parfitt and Mr. Doe:—Mr. Parfitt for an account of the partial exploration of Barrows at Upton Pyne, at which he was present; and Mr. Doe for a description of Barrows at Burrington.

EDWARD PARFITT, Chairman, *pro tem.*
R. N. WORTH, Hon. Sec.

EXPLORATION OF BARROWS IN THE PARISH OF UPTON PYNE.

SEPTEMBER 18TH, 1879.

THE barrows referred to in this communication are situate on a farm called Stephenstone, the property of Sir Stafford Northcote, Bart., M.P., and occupied by Mr. Huggens. The field in which they lie is called "Nine Oaks." The barrows are three in number, and lie in line in the direction of east and west. The two to which we directed our attention were the first and the last. The centre one was explored about ten years ago by one of our members, the late Rev. J. Kirwan, who found in it a bronze pin and an amulet or necklace of beads, formed of perforated bits of shale, and one fusiform central bead, and a portion of the stem of an encrinite or fossil sea lily. This latter was probably obtained from Westleigh, where fragments of these stems are not uncommon in the blocks of limestone. The large bead is worked in chevron pattern. These, with a very perfect little incense cup found in another barrow, were presented to the Albert Memorial Museum, Exeter, by Sir Stafford Northcote, and are figured and described in our volumes for the years 1869-70.

The barrows at present under consideration were each about 140 feet wide east and west, and about 120 north and south. Having been so long subject to the action of the plough and harrow they form but slight elevations now; but from the mass of soil spread out around them they must formerly have been considerable mounds.

On Thursday, September 18th, in the presence of Sir Stafford Northcote, H. Northcote, Esq., the Rev. A. F. Northcote, and several other gentlemen, we began operations by cutting a trench four feet wide in an east and west direction. At about ten feet from the centre, and about twelve to fourteen inches deep, we came to a stratum very much blackened, apparently by the action of fire. This was continued to about the same distance from the centre all round. Below this we came to evidently burnt earth, mixed with fragments of charred wood. There were mixed with this burnt earth some patches of clay. From the admixture of these we were of opinion that this barrow had been opened; but we found no proof of this. However, we found nothing in this trench. We then determined to cut another at right angles to this, which was done. We found in one place on the north side quite a little heap of rather coarse charcoal;

but this was all. We did not see a fragment of pottery or of bone. Not finding anything in these trenches, we had the angles of the trenches removed, so as to clear a large space in the centre; but this also proved abortive. The barrow had probably been opened at some former time, of which we have had no information.

It was now late in the afternoon, but we determined to try the other barrow. As, however, we had not time enough before dark, we thought it best to sink a hole as near the centre as possible. We then had a hole dug, about six feet wide, and sunk down; and carefully noting the excavation, we soon came to earth that had evidently been burned or subjected to the action of fire, very like the first that we had explored. At about four feet six inches from the top the workmen came to what we at first imagined was a cairn or heap of stones. Great care was then exercised for fear of disturbing this imaginary cairn, but as we progressed we found that the stones really consisted of a flooring or pavement of pieces of what is called "iron pan," veins of which are so frequent in the New Red Sandstone; these pieces were all covered with a blackened crust, and on fracturing some of them they showed a very bright red line for about one-fourth of their thickness, such as would be produced by the action of fire having been burnt on them; this flooring extended beyond our excavation on all sides, but night coming on we were obliged to abandon our exploration.

E. PARFITT.

BURRINGTON BARROWS.

On the 28th May, 1880, being "on pleasure bent," I made a pilgrimage to two barrows, situate in a field at the north-west corner of the parish of Burrington. The field, formerly part of "Burrington Moor," * where, says Lysons, "are many barrows," lies on the left side of the highway, leading from the old Barnstaple and Exeter turnpike road to Dolton Beacon, about three miles distant from the Portsmouth Arms Railway Station, on an elevated track of table land, commanding an extensive prospect, bounded on the south by Cawsand Beacon and Yes Tor.

The large barrow, which is almost close to the road, is about eighty feet in diameter and six feet in height, and appears to have been partially opened some years since, for there is on its summit a depression of the depth of nearly three feet in the centre.

* First Report of Barrow Committee, *Trans. Devon Assoc.*, vol. xi. p. 148.

The other barrow stands about fifty-four feet south-east of its neighbour, being equal to it in diameter, but about two feet less in height.

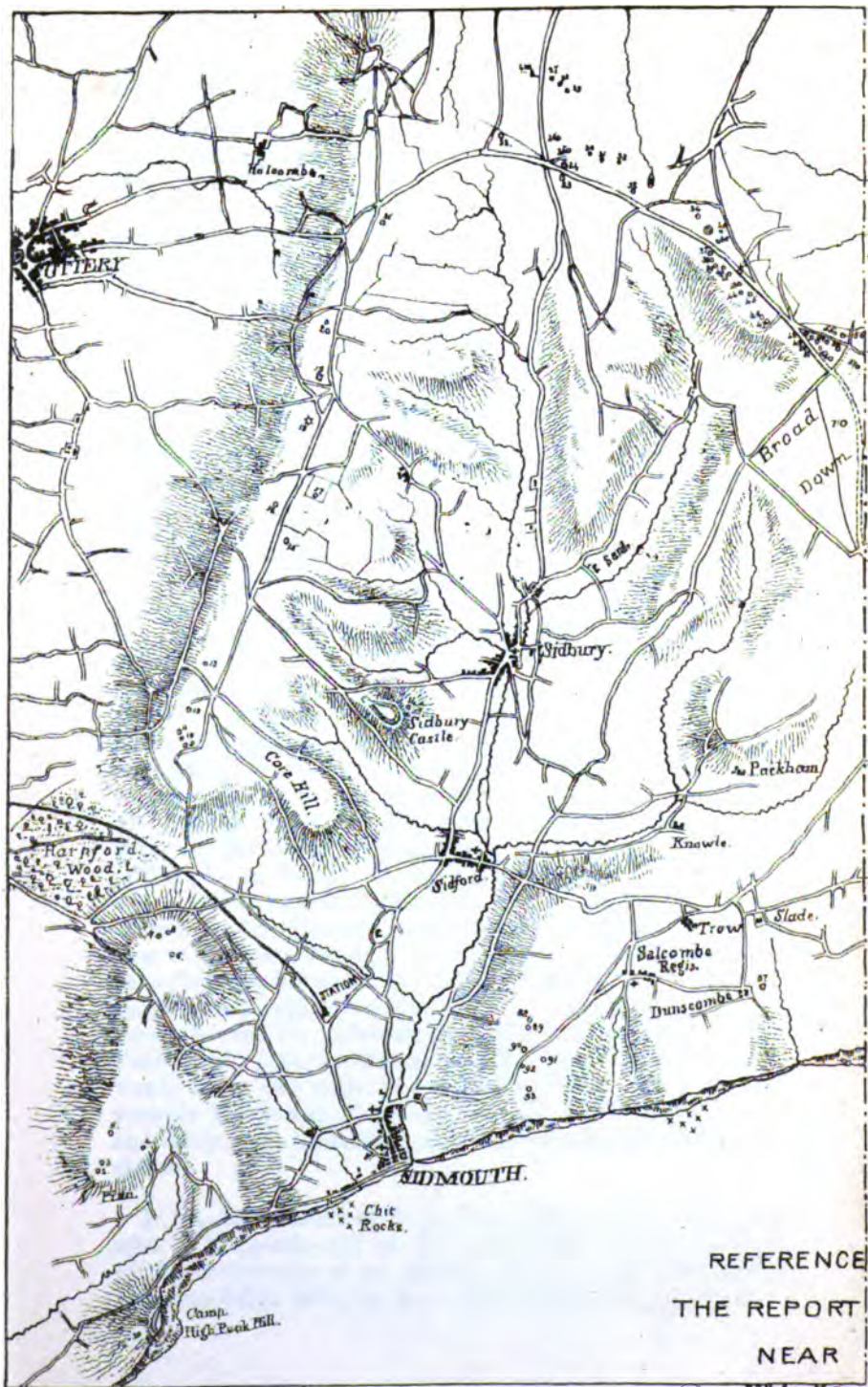
This also seems to have been partially opened. It is impossible to give a definite statement of the original height and contour of these mounds, as they have been certainly more than once subjected to the plough.

GEO. DOE.

REPORT ON BARROWS NEAR SIDMOUTH.

As a contribution towards the general stock of information on the subject of the barrows still remaining in this county, I beg to send to the Committee some account of those that are found on the hills near Sidmouth. On throwing my notes together I am amazed to find that during the last thirty years I have visited and plotted down no less than ninety-three barrows, all lying within a radius of six miles of Sidmouth. In these expeditions I have been almost always in company with our member, Mr. Heineken; for we have been in the habit of pursuing our antiquarian researches together. Both Woolcombe and Lysons had an idea that there were more tumuli on the north than on the south side of Devon (*Trans.* xi. 147); but it may be a question where so many as ninety-three could be found, all confined within a half-circle, struck with a radius of six miles. An account of these barrows would be valueless to the Committee or to the general reader without some sort of reference map to point out the localities where they lie, or how any particular one might be found. It was necessary therefore to supply one. And in respect of the objects met with in some of the barrows on the Honiton range of hills, it will be an advantage to give sketches of them, inasmuch as where they have been depicted before, errors in the dimensions and measurements have inadvertently crept in. In distributing the numbers over the reference map, No. 1 is placed on High Peak Hill. The increasing numbers then proceed northwards along the ridge of Ottery East Hill, then eastward towards Northleigh, then south to the sea at Branscombe, and lastly, west back again to Sidmouth, thus completing the circuit.

1. On the summit of High Peak Hill, a mile and a half west of Sidmouth, and on the coast, there remains a portion of the earthworks of an ancient camp, though the greater part has fallen into the sea. Just outside the west end of



REFERENCE
THE REPORT
NEAR

the great agger, and on the platform before the second descent, there is a heap of stones only slightly jutting above the ground. I am not very confident that this is a tumulus at all; but I think it right to point it out for the consideration of others.

2. Pin Beacon. The word pin comes from the ancient vill of Penne, Pyn, and Pinn (in the valley below), mentioned in the *Otterton Cartulary* from 1260 to 1300. There are two large mounds on the ridge of the hill, having all the appearance of having originally been regular burial heaps; but they do not show any traces of ever having been examined. From time immemorial they have been known as Beacons, perhaps by heaping wood on them, and setting it on fire. The heap nearest the south point of the hill is called the Old Beacon. About 1810 this point was planted with fir trees. One of the largest, measured by the apomecometer (see *Student* for April, 1869), proved to be 55 feet high, and 4 feet 3 inches in circumference. Rather more than fifty yards north of this there is an earthwork drawn across the ridge of the promontory, and running down on each side till it meets with modern fences, thus cutting off the Old Beacon from any approach along the level of the ridge on the north. This earthwork is an agger, with a ditch on each side; but it is too large for an ordinary hedge, and from its position looks more like a defensive work. A gap has been cut in the middle, and the earth thrown aside.

3. At about forty yards north of this work stands the New Beacon, so called. This is a mound similar to the former. On digging slightly into the summits of these places they were found to be composed of the fox-mould of the greensand formation, here immediately lying on the red marl, and a few pieces of charcoal were met with. The trees round this Beacon were planted about 1830. The next enclosure, further north, was planted with young trees in 1867.

4. A mound on the open moor of rather doubtful appearance.

5. This is a tumulus of medium size on the open heath. It does not appear to have ever been meddled with.

6. A cairn of dry, white, angular chert and flints, common to the neighbourhood. It has been somewhat disturbed, and it is nearly concealed by weeds, bushes, and fern.

7. A cairn of dry flints is said to have been removed from this spot about the commencement of the present century for the sake of the materials. There remains nothing now

but a circular depression in the ground 18 inches deep, and 33 feet in diameter, overgrown with heath in a plantation. I could never learn any particulars of the removal. Whether a cyst still remains under the surface in the centre could only be proved by excavation; but the probability is small. Bulverton Hill here attains a height of 694 feet above the sea level. To reach this place from Sidmouth go by way of Cotmaton and Bickwell to Salter's Cross, and then into the plantation over the gate on the right.

8. A few yards from the former lies a large scattered heap of dry flints. Portions have occasionally been carried away within memory. The heads of two or three large blocks of flint breccia, common to the hills here, formerly jutting above the smaller stones, and may have indicated the likelihood of a kist-vaen; but they were pulled up and removed shortly before 1868. No proper examination has been made. The land forms part of the Bicton estate. On visiting the spot recently I find that in 1879 the whole of the interior part, comprising an area 66 feet in diameter, was removed. I cannot discover whether anything was met with.

9. At about 200 paces south from the bifurcation near No. 12, and 73 from the road (hoping I paced it correctly), there is a low barrow, five yards in diameter.

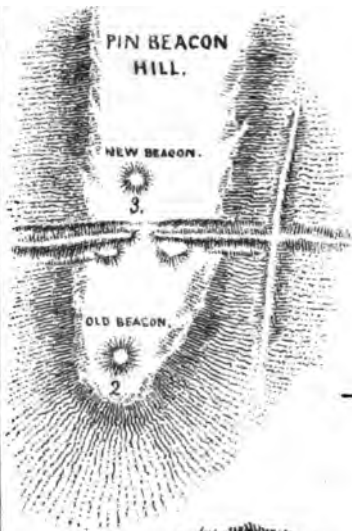
10. The next, close to it towards the north-west, is eight yards in diameter.

11. At 23 paces further on in the same direction there is a small one, only three yards in diameter. Had not the heath and furze been recently burnt off the hill they would scarcely have been detected at first.

12. On the west slope of the hill at this place a man living close by said there were formerly two or three "stone barrows," but that they had all, or nearly all, been removed.

13. This is the remains of a stone barrow or cairn of dry flints, lying on the steep side of the hill on the open moor, just above the cottage. (*MS. Diary*, October 10th, 1871.)

14. The Treasury, so called, in the plantation on the Sidbury side of Sidbury Castle. It is a cairn of dry flints that has been considerably tampered with on the top, under the common but silly idea that treasure lies buried there, but the kist-vaen or central interment has certainly not been reached. It is also called the Money Heap. The land belongs to Sir Stephen Cave, G.C.B., M.P. Several legends are current in Sidbury and the neighbourhood respecting the crock of gold said to be buried there, and the attempts that at different times have been made to get it; but they are too long to



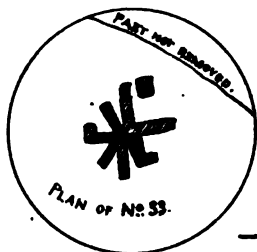
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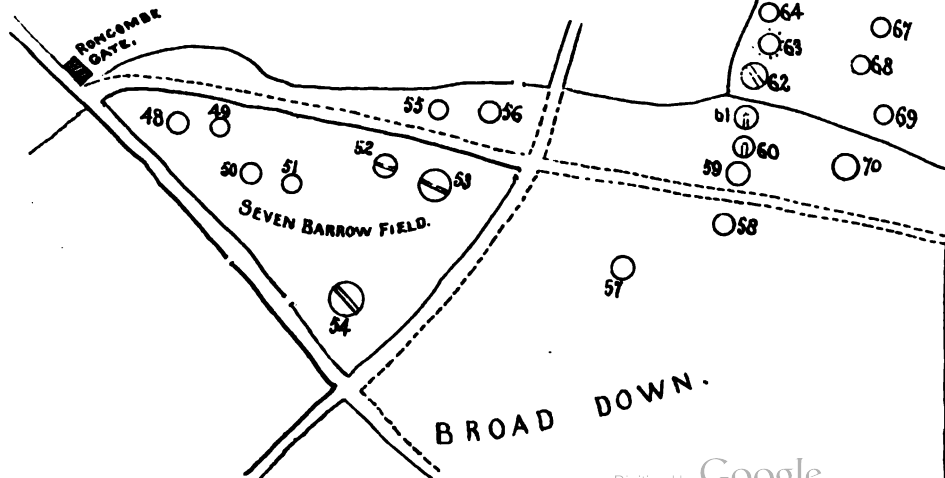
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SECTION OF NO. 32.



SECTION OF NO. 34.

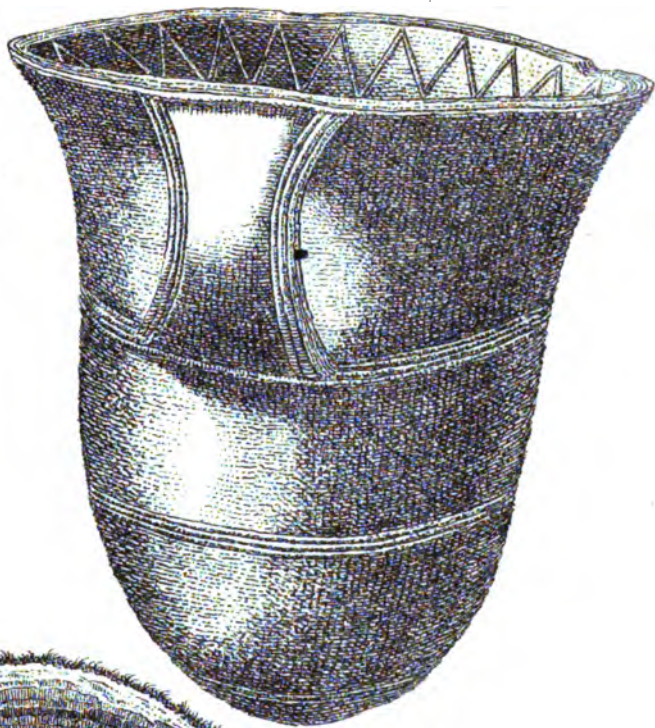


KIMMERIDGE COAL

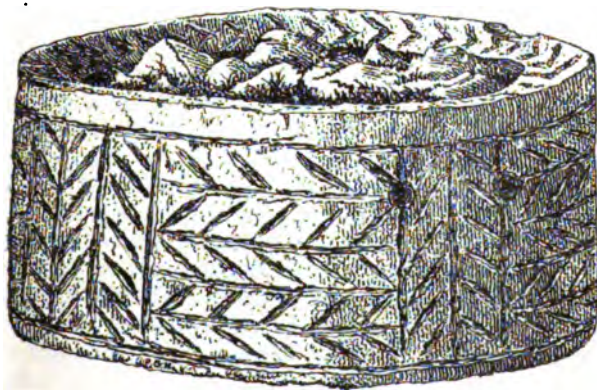
DRINKING CUP

From Barrow N^o. 53.

FULL SIZE.



SECTION OF N^o. 53.



CLAY VESSEL FULL OF CALCINED BONES,
FROM N^o. 54. FULL SIZE.



SECTION OF 54.

insert here. I have collected them by degrees from Sidbury people. (See my MS. *History of Sidmouth*, vol. i. p. 47.)

15. At 782 yards, or nearly half a mile, north from the lane that comes up from Sidbury Castle, there is a cairn over the hedge in the plantation on the east side of the road. This distance was estimated one day, when out with Mr. Heineken, by counting the revolutions of the carriage wheel, and going through an arithmetical calculation accordingly. The cairn is apparently of dry flints, but it is very much grown over with heath. It has been slightly dug down on the side towards the hedge. (MS. *Diary*, where the original memoranda are inserted under July 20th, 1869, and October 10th, 1871. This *Diary* and my *History* are eventually destined for the Free Library of the Exeter Museum; but you must wait till I am dead.)

16. Of flints on the open heath, some forty or fifty yards on the west side of the road. A portion of its western side has been dug down and carried away, but no proper examination made.

17. A cairn of dry white flints close to the south hedge of a field. It is 57 feet in diameter. All the centre portion has been removed, and there are a number of large blocks of stone built into the base of the hedge, by which it may be inferred that the barrow was destroyed when the hedge was made, about 1830. It is just possible that something might yet be met with if an excavation were made in the middle of the circular area. The land on the east side of the road belongs to Sir Stephen Cave.

18. This is a large barrow that has been fancifully cut into the form of a star of six points. (No. 18 in the plate.) The centre does not appear to have been touched. This form has been produced by scarping down the sides, so as to make a zigzag trench all round. Of course this is a modern operation. If it were done when the fir trees that grow on it were planted, judging by their size, perhaps it was about 1820.

19. A barrow with four points, the sides being incurvate. This barrow was probably planted and pared round at the same time the other was. One of the trees on it measured 52 feet high.

20. Tumulus by the road-side, still intact.

21. At about 200 or 300 yards south of the Ottery end of the Chineway Head Road, and in the plantation on the east side of the track on the hill, there is a mound among the trees. Nothing but actual search would find it.

22. A cairn of dry flints a few score yards to the east of a

cottage. The cottage is a lodge by the side of a road leading northward to Combe, the residence of the family of Marker, to whom the land for miles round this neighbourhood belongs. The heap had been very much disturbed, and portions abstracted, perhaps wherewith to build the cottage. What remained had a diameter of twenty-nine paces. (*Diary*, Aug. 7th, 1871.)

23. A barrow over the hedge in the plantation, on land belonging to Sir Stephen Cave. The Rev. R. Kirwan, late vicar of Gittisham, disturbed it about 1867, but made no careful examination, and found nothing. It is a pity that such operations should be permitted by the owners, as they lead to no result—they confuse the heap by mixing the soil, they destroy landmarks that would be valuable to more careful searchers, they endanger the safety of objects that may be buried there, and they spoil the chances of success to scientific examiners afterwards.

24. A very large tumulus on the north side of the road, on land belonging to Mr. Marker, of Combe. It appears never to have been attacked, and the beech and fir trees growing on it are of great age. Regard being had to its size, instead of a grave-hill, perhaps it was a speculum, teut-hill,* or look-out station. At one period it was probably surrounded by a ditch; for a ditch with water in it still remains on its eastern side.

25. This barrow, at eighty paces north of the preceding, was opened August 20th, 1869, on the occasion of the visit of the British Association to Exeter, a party of whose members made an excursion to this hill. So large a slice of the afternoon, however, was consumed at the splendid collation in the tent near the six-mile stone, together with many other slices of a variety of good things, that there was no time left to complete the examination of the barrow, or even to open the kist-vaen. A trench from the south margin to the centre, and beyond the centre, had been run into this barrow the day before the meeting, in anticipation of the visit, under the direction of Mr. Kirwan, who lived near, and the black mould cleared away, down to the crown of a cairn or kist-vaen of flints. It was in this state that I saw it. It was intended to open the cairn or kist-vaen in the presence of the visitors, but they did not visit the spot. The earth was afterwards thrown in, and the trench filled up as before, and, to the best of my belief, the kist-vaen still remains intact and undisturbed.†

* Teut-hill, from Teutates, the ancient British deity.

† *Trans. Devon. Assoc.*, vol. iv. p. 299, slightly mentioned at foot of page.

26. Still intact.

27. Situated at about 250 yards east of the mile-stone, six from Sidmouth, and three from Honiton; about sixty feet in diameter, and five high. It was opened on the same occasion as No. 25. I was on the hill at the diggings August 16th, 19th, and 21st, 1869. There was a top covering of soil, on which grew the wild heath, furze, and fern that overspreads the wide expanse of this hill; under this there was a stratum of white angular flints about a foot thick, which extended over the crown and south-west side; and then the body of the mound was made up of black peat earth, cut on the spot, and laid in moderately regular strata. Some flint flakes were met with, a Queen Anne's shilling, a beach-pebble sling-stone, some pieces of red ochre, with traces of charcoal and pottery. I also saw a large pebble, bruised on one side, probably a pounder or hammer stone, but this was afterwards lost sight of. It occurs to me to add that the direction of the cutting through this barrow was E. and W., or N.E. and S.W.—a point worth noting. (See *Trans. Devon. Assoc.*, vol. iv. p. 297, for Mr. Kirwan's account.)

28. From 50 to 100 yards S.E. from the preceding another was opened at the same time by running a trench from the S.E. into the centre. There were traces of cremation, but no deposit met with. A circle of large rough flints, from 12 to 18 inches long, had been set in open order, inside which had been raised a heap of earth; over this heap there was a layer or covering of the smaller angular stones of the hill; and lastly, over the whole, and extending beyond, and covering the ring of large stones, there was a considerable thickness of dark mould. Either beneath or beside one of the large stones four shapeless pieces of bronze were met with, weighing respectively $1\frac{1}{2}$ oz., $5\frac{1}{2}$ oz., $8\frac{1}{2}$ oz., and 10 oz. (*Op. cit.* iv. 297-8.)

29. A few yards further to the S.E. there is a circular patch of fern (the *Pteris aquilina*) surrounded by the furze and heath. There is no mound here, but the difference of vegetation suggests that something of the sort had been removed from this spot.

30. A barrow on the open heath 160 paces north of the road.

31. Another, 80 paces S.E. of 30.

32. A large and bold tumulus 130 feet in diameter and 13 high. It is mostly overgrown with fine grass, and a few, I think four, aged and weird-looking fir-trees occupy its summit. It is surrounded near its base by a hedge between two ditches. This enclosure was probably made when the

trees were planted. The mound does not appear to have been dug into.

33. A barrow wholly made up of the black mould or bog-earth of the hill, which had been cut in clods and laid in tolerably even strata. The greater part of this mound was removed soon after 1850, and the fine mould used for agricultural purposes on the fields lying on the south side of the road. About a quarter of the mound was left on its N.E. side. During one of the many visits paid to this spot I found within its area a flint flake of unusual appearance, remarkably broad and flat and symmetrically shaped, which I subsequently sent, with 100 others of my collecting, to the Exeter Museum. (*Diary*, July 24th, 1877.) On one occasion Mr. Heineken and myself took men from Sidmouth, and beginning in the middle of the level area, we first sunk a pit, and then ran trenches in radii in various directions; but, meeting with no discoveries, concluded that the men must have removed the burial remains when they removed the mound. This spot is 30 paces from the road, and a few score yards to the N.W. of the fifteen milestone from Exeter, and nearly south of the pond or swamp known as Ring-in-the-Mire. (*Ib.*, July 25th, 1854; and 33 in the plate annexed.)

34. A large and conspicuous barrow like No. 32. It lies at about 300 yards N.W. from that small circular intrenchment known as Farway Castle, on the flat but elevated crown of the hill, here about 800 feet above the Esplanade at Sidmouth. A few gaunt-looking fir-trees remain upon it, on the westernmost of which the Ordnance surveyors fixed a staff in 1851 to assist in the triangulation of the country. A deep and narrow trench has been cut round the circumference of this barrow so as to enclose it, and the earth thrown up on each side. Like the case of the other, this was probably done to keep off cattle or trespassers when the trees were young. It does not appear that any attempt has been made to meddle with the centre. (Pl. No. 34.)

35. A low and small one on the open heath, 200 paces E. of Farway Castle.

36. Near the north side of the road.

37. Close to the south side of the road.

38. Low, and not strongly marked. It is so encumbered with furze bushes that observation is difficult.

39. This one, which is not large, is much concealed also.

40. These three last are near each other, and nearly in line. We must assume that they are barrows, but they are much hidden with bushes.

41. This barrow is 300 paces S.E. from the group of the three preceding, and 60 from the road.

42. The public road has been taken right through this tumulus, thus carrying away all the body or central portion of it, and leaving only two segments, being a piece on each side of the road. I take this to be the barrow spoken of by an old man living at the southern end of Broad Down, in a cottage near Rakeway Bridge, who told us he had attained the remarkable age of 89, and said that at nearly 100 years before the time at which he was then speaking (August 17th, 1859) the road over the Down from a mere track was improved, widened, and levelled as we see it in the present day, and that his grandfather was one of the men employed on the work; they cut through a barrow near Roncombe's Gurt; and on being asked whether they found anything in it, he replied, "No; nothing but an old taypot." This must have been the sepulchral urn. He admitted also some traces of bones and pieces of weapons. Some other men near Ring-in-the-Mire corroborated this, and said that they believed the objects found were carried to Netherton Hall, the seat of Sir Edmund Prideaux, Bart. Subsequent enquiry, however, has failed to get any tidings of them.

43. Untouched apparently. It is a small barrow 28 feet in diameter and three feet high. The furze had been burnt off it, otherwise it might have remained unnoticed. It is about 100 feet N.W. from 44.

44. A large tumulus 98 feet in diameter and seven high. There is a boundary-stone on the crown of it; and to all appearance no attempts at excavation have been made.

45. A comparatively small barrow, measuring 30 feet in diameter and three feet high, scarcely ten yards from the preceding large one. It is much covered with grass, heath, and furze. Walking over it July 18th, 1871, I stepped in among a covey of young partridges with their mother, and scared them dreadfully; but I drew off and allowed them to recover.

46. Two mounds, apparently barrows, first noticed by Mr. Heineken, lie close together beside the lane leading from the open heath down to Roncombe. They are on the unenclosed ground, and at 108 feet from the hedge of the cultivated land down the lane. No. 46 is 23 feet in diameter and two and a half high.

47. This is 30 feet across and three high. It is close to the road, and most of the central portion has been cleared out by a square excavation, probably for the sake of the materials.

This ends the western division of the barrows. Some 300 yards further eastward we come to the site of the old Roncombe Turnpike Gate. The hill contracts here to a narrow ridge, occupied by the road, the valley of Farway being on the north, and the precipitous and romantic chasm known as Roncombe Gurt, where rises one of the tributaries of the river Sid, on the south. There is a story current in the neighbourhood to the effect that about the beginning of the present century some smugglers, who were one night conveying some contraband spirits inland from the coast, met some excisemen on Broad Down, when a very severe struggle took place between them. One or more of the excisemen were killed, and their bodies thrown down the chasm. Some of the smugglers however were afterwards taken, tried, convicted, and hanged at Exeter.

But reverting to an earlier period, and taking a survey of the barrows scattered over these hills, it will be seen that they cluster most closely to the right and left of this ridge. If the ancient warriors who succumbed in battle had their burial mounds raised over the spots where they fell, as some archaeologists have stated, the number of barrows on each side of this narrow pass may well indicate that frequent and deadly contests took place on this debateable ground. A hostile tribe coming up on one side of the narrow neck would be resisted in its attempt to pass over by the tribe on the other side; and hence fierce and bloody battles would ensue. A glance at the map will show that all the roads on each side lead up or converge upon this point. This fact, and the adjacent clusters of grave mounds thickening in closeness as we draw near, are certainly not without their significance.

48. Having passed eastward over the neck we come to a three-cornered field, which, I believe, has been enclosed from the open moor within the present century. At my earliest recollection of this spot there were seven mounds within its area, all very perceptible; but the annual perseverance of the plough has well-nigh obliterated the four western ones, which were smaller than the others. No. 48 is a very low mound, scarcely visible except when the field has been ploughed and harrowed. The greater prevalence of an accumulation of white flints at this spot makes it more discernible at a little distance than at the mound itself.

49. The same remarks apply to this one.

50. The scattered white flints of the nucleus of this small and ploughed-down barrow first catch the eye when the

ground is bare. April 4th, 1871, I picked up a worked flint core near this spot. (*Diary.*)

51. This is the fourth grave mound in Seven-barrow Field (as I generally call this field for want of a better name), and the busy farmer has done his best to level them all. None of them appear to have been designedly opened, and it is just possible that the plough may have passed over any deposit; and if so, a careful examination promoted in the centre of any of them might turn up something. The land forms part of the Netherton Hall Estate, the property of the late Sir Edmund Prideaux, Bart., but I trust that no one will be allowed to meddle with these burial-places, unless he has first proved himself to be a sufficiently-informed archæologist; and secondly, a careful excavator.

52. Towards the northern verge of the field. This is larger than the preceding four, and of good elevation. At the time of the meeting of the Devonshire Association, at Honiton, in 1868, this and the two following were trenched. The trench through this one was carried in a direction nearly parallel with the neighbouring hedge. It was not above two or three feet wide, and nothing was found.

53. This is one of the large ones. It was examined by the Rev. R. Kirwan in July, 1868. It was 95 feet in diameter and about eight high. Possibly there had been a foss round it, but few traces remained. The trench was begun from the south-east, at a width of about four feet, and carried through; but for the purpose of further examination it was considerably widened out, and a large portion of the centre entirely put aside, by which a sort of pavement of rough flint stones, nearly three yards wide and about four long, was revealed to view. The present Lord Coleridge came up on the hill, and, lending a willing hand, he worked like a navvy. Upon the flint stones rested a layer of charcoal, and on the charcoal a flattened mass of disintegrated calcined bones. Lumps of red war paint, or ruddle, were occasionally met with, and this is not unusual in other barrows. We are induced to infer from this that the ancient Britons followed the barbaric practice of decorating their faces or bodies with stripes and blotches of red paint, either to look terrible in war, or else to look exceedingly becoming on great festive occasions, as I have seen some tribes of the North-American Indians do at the present day. The Kimmeridge coal drinking cup was found close to this central deposit. A small piece of the edge or rim was accidentally knocked out with the pickaxe. Mr. Heineken afterwards calcined this to charcoal, when the

woody fibre was clearly perceptible under the magnifier. Mr. Kirwan's account of his labours on this barrow is printed in the *Transactions*, v. ii. p. 624, where it is called Barrow A. The woodcut representation of the cup is half-an-inch too wide, which gives it rather a clumsy appearance; but this is explained by the fact that the cup became oval in drying, and the long diameter now measures three inches and five-eighths, and the short diameter is two inches and nearly seven-eighths. The true or original diameter would be a medium between these two, and that I have tried to give to my sketch under No. 54. The section of the mound exhibited traces of stratification, as if black earth, and peat, and clay had been used. Some thought part of this was foreign to the neighbourhood, but I think not, as there are clays of different colours under the turf by the gutters on the eastern and some other parts of Broad Down. The cup had not long been taken from its cold and damp bed of clay, and exposed to the dry warm atmosphere of July, when it began to shrink and crack, so it was put into a basin of water at the turn-pike. Mr. Heineken and myself took it out of the water, and there I made my first sketch of it. It has been turned in the lathe, as the encircling striæ of the tool sufficiently indicate, and the handle is worked out of the solid. Inside the rim, about half-an-inch broad, a fine bead is carried all round in a zig-zag pattern. Three small beads or half-rounds encompass the outside of the rim at the top of the handle; and at the bottom of the handle, an inch and five-eighths down, four rings have been turned; still lower, half-way to the conical bottom, three beads have been carried round; and lastly, three more rings, having a diameter about that of a shilling, surround the point at the lower end. For the purposes of this report I have recently repaired again to the Museum, where Mr. D'Urban, the curator, opened the cases and re-took all the measurements, as well of the cup as of the incense vase, and another cup presently to be mentioned. The cup is now of a fine, deep, rich brown, with a slight polish. The barrow has all been filled in again.

54. This is the large barrow in the south corner of the field. There is no perceptible foss round it. A trench from six to seven feet wide was begun on the south-east side, and carried quite through to the north-west. No interment was met with. The section or sides of the trench, exhibiting the composition of the mound, and of which I made a sketch on the spot, presented the appearance of irregular blotches of charcoal not in strata, in some parts very black; whilst

UNDER SIDE OF PRECEDING CLAY VESSEL, FROM 54.



SECTION OF 57.

FRAGMENT A. FROM 57.



FRAGMENT B. FROM 57.



SECTION.





SECTION OF No. 60.



SECTION OF 61.



BRONZE FROM 61.

RIVET.



KIMMERIDGE COAL CUP.

FROM No. 61.

FULL SIZE.

in others the shade was lighter, owing to a larger admixture of sandy earth, and these were more or less intimately distributed among patches of sandy earth of different shades of red, graduating upwards into the common brown top soil. This red appearance some ascribe to the action of fire, inasmuch as fire is red; but I look at this ascription with reserve, because the products of combustion more generally result in ash-grey. There is a great deal of oxide of iron in the soil about here, and the red colour may have been produced as much by this as by the agency of fire. In Mr. Kirwan's description this tumulus is spoken of as Barrow B in the *Transactions*, vol. ii. page 634. Unfortunately that gentleman was so very much occupied in Honiton, at the time of the meeting there in 1868, that he was unable to be with the labourers whom he had set to work to make the excavations. When the meeting was over the members, with their friends and neighbours, proceeded from all quarters to the hill for the purpose of inspecting the barrows; and no one who was there will easily forget the beauty of the scene, the multitude of the company, the brilliant weather, the variety of the costumes of the picturesque groups that strolled about the wild heath, or sat on the summits of the silent grave-mounds, or the sumptuousness of the entertainment provided under the tents that had been pitched in the enclosure across the road to the west of Seven-barrow Field. Mr. Blackmore, a gentleman from Torquay, was walking over the newly-turned out earth on the eastern flank of the barrow (somewhere about A in the section of 54 given in the illustration), when he espied and picked up the cylindrical clay vessel full of calcined bones, also in the illustration. I made a sketch of it on the hill; but have twice revised and corrected it in the Museum. It is of light brown clay, three inches in diameter, and one and a half high. The pattern or ornament is produced by cuts or slashes. Thus two lines are carried all round—one below the rim outside, and the other above the bottom edge. These are united by groups of a few perpendicular lines a quarter of an inch apart, and these again are tied by open horizontal lines, the intervals between them being filled up with sloping cuts, producing a herring-bone pattern. The bottom has a circular cut all round near the edge; then two diameters drawn from one side to the other, and crossing each other at right angles in the middle; and these are flanked by shorter parallel lines, until the whole surface of the bottom is covered, as shown in the next plate. The top rim slopes inwards, and as the sides of the

vessel are nearly half-an-inch thick, there is room enough to ornament this sloping rim with a series of indented chevrons. The little vase is packed full of fragments of white and clean burnt bones, intermixed with dead grass apparently, the threads and filaments of which are visible. Now it may be assumed as a certainty, that as this vessel was picked up unsullied by any clay, dirt, or earth, but fresh and clean, it must have been enclosed and protected within some other and larger urn, which the ignorant workmen must have broken to pieces with their tools, and never saw. Such fragments of a larger urn have never been found; but they must be there somewhere. This shows the necessity of never leaving workmen for a moment when they are engaged in such researches; for no one knows what the next spade full of earth may reveal. A few days afterwards the labourers were put on the work again. They widened out the trench towards the east and north, and at last came upon a bed of oak charcoal on the natural surface of the ground, a few pieces of ruddle, and a flattened mass of calcined bones. Mr. Kirwan, who was then present, considered this as the original interment. The earth was also cleared out for some feet on the south-west side of the trench; but in these works there were only found some small pieces of pottery without pattern, the fractured edges of which were not fresh, but rather time-worn, and near the surface two larger pieces; but there was nothing to prove that they were parts of the urn that had been overlooked. I do not know whether these fragments were saved. Mr. Heineken made a photograph of the barrow, taking his stand to the north-west, and looking through the trench. And we measured its diameter by taking the tape through the trench, making it 99 feet broad, and 8 feet high; but as the edges fine off to nothing, different measurers might arrive at somewhat different results. The whole was afterwards filled in.

55. A small mound of earth and stones, north of Sevenbarrow Field.

56. A small mound of earth and stones, the southern half of which was dug down in 1870 by the Rev. R. Kirwan, and, after finding burnt bones and ashes, abandoned. It is of peat and clay, 36 feet across and 3 high. (*Trans. Devon. Assoc.*, vol. iv. pp. 301, 302.)

57. A barrow of earth and stones on the open moor. The examination of it was undertaken by Mr. Kirwan, in July, 1868; and I was with him assisting in the work on two different days, one of them being dry, but the other being

extremely wet, when we were driven into a tent pitched on the heath, together with Mr. Heineken and Mr. and Mrs. Hine-Haycock, of Belmont, Sidmouth, with some friends, who had come out that morning. It was said to be 70 feet in diameter and 6 high, but I did not measure it. Some very large and old furze bushes had long held possession of the summit, but these were cut away. Under a foot or so of top soil there was a considerable thickness of reddish-sandy earth blotched with yellow, and a farmer on horseback, who was passing eastward along the northern road, turned to look, and gave it as his opinion that that reddish earth did not belong to the neighbourhood. I do not always accept these haphazard assertions very confidently. Not very far under the surface, as may be seen in the chasms, lies the fox-mould of the greensand formation, of a yellow colour; and although the common products of fire are mostly grey, it is possible that where oxide of iron exists in this fox-mould, a red colour may be elicited by heat. This "burnt earth," as some called it, I suspect was fox-mould. The centre of the barrow was a cairn of dry, white, angular flints, encompassed with blocks of breccia, weighing on an average about half a ton by estimation, and set at intervals of two to three feet all round. I assisted in turning over several of them, and they were rough masses nearly three feet high. I believe they were the common silicified clay and flint blocks that lie scattered over the surface of the hills here about, but which occur most abundantly nearer to Sidmouth, and not taken from the Farway Brook, as Mr. Kirwan suggested. Near the centre of the cairn some charcoal was met with, and then the fragments of an urn, not in a cist, but crushed by the flints. I sketched the best piece in the tent, and give it in the plate as fragment B, from No. 57. This barrow is marked C in Mr. Kirwan's account in the *Transactions* (vol. ii. p. 641), and an excellent woodcut of the same fragment accompanies it. This urn, as restored by him, was 7 inches high, 3 in diameter at the base, 8 at the swell of the body, round which part a twisted thong had been drawn, 7 the diameter of the rim, and 6 the open mouth. The broken pieces lay among charcoal and black earth, and upon considerable traces of burnt bones gone to powder. The inside slope of the rim was set off with a few parallel lines, imperfectly indicating a zigzag, and the edge was jagged with a stick. The colour was reddish-brown without and dark within. After this the barrow was nearly all turned over, at all events within the great stones, when various pieces of pottery of different make and quality

were met with. I am not aware whether they were saved, but I believe the best of the finds are in the Museum. Towards the eastern verge of the cairn, or stony portion, in a cist made by piling up the flints like a dome (is not this an early instance of the arch?), more than half a yard above the ground, a clay vessel, $7\frac{1}{2}$ inches high, was met with, and $4\frac{1}{2}$ inches in diameter. A little way to the west of it lay traces of burnt bones, but no ashes. On exposure to the air it soon fell to pieces. The outside was ornamented with a series of incised horizontal lines encircling the body from top to bottom, at intervals of about three-eighths of an inch; and between two of the upper ones, near the rim, a number of perpendicular cuts at open distances had been made all round. I took a sketch of one of the best pieces after we had been driven into the tent, and give it in the plate as fragment A, from 57.

58. The most southerly barrow of an irregular line of seven, running away towards the north.

59. Across the road over the open moor, and the second of the seven, from the south. Not been opened.

60. A mound of flints covered with peat and clay. Opened in 1870 by a trench, four or five feet wide from the south to the centre. Diameter nearly 90 feet, and elevation about six. Burnt bones in the centre, and near them traces of a bronze quite gone to decay. (*Trans. Devon. Assoc.*, iv. 303.)

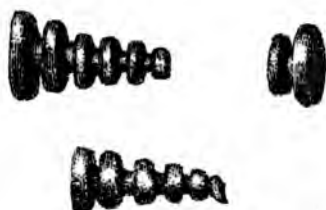
61. Seven feet high and 120 in diameter. Opened in 1870 by a trench from the south to the centre. Surrounded by a shallow foss, and a ring of large detached stones, like No. 63. There was a cairn of flints, covered with three or more feet of earth. The kist-vaen had fallen in. Within it were found burnt bones on the bark of a tree, and the remains of a bronze spear-head, or perhaps a dagger, quite fragmentary, and also a rivet. Three feet from these a Kimmeridge coal cup was found, somewhat resembling that in No. 53. This tumulus was opened by Mr. Kirwan. I was unable to be present. He has given an engraving of the cup in its perfect state. I give one as I saw it in the Museum. Unlike the other, which resembles dark brown wood, this one looks cracked and fragile, and very like charcoal. This barrow is letter E of his description, at p. 302. He writes: "Upon a subsequent occasion I was enabled to proceed with the investigation of the group of seven barrows, which occupy the eastern escarpment of Broad Down. The tumulus (E) which now came under our notice occupied the centre of the group." The group of seven barrows here



SECTION OF № 62.



BRONZE SOCKETED CELT IN 62.
FULL SIZE.



BONE OBJECTS IN № 62.



KIST-VAEN IN № 62.



VIEW OF № 63. SURROUNDED BY A CIRCLE OF STONES.

indicated are those numbered 58 to 64 inclusive in the annexed map, or what is better, in the enlarged plan of part of Broad Down in the plate; and "the centre of the group" must necessarily be the fourth, counted from either end. In this case it is No. 61. Remember where 61 is, and that the black cup was found in it.

62. I must quote a few words more from Mr. Kirwan's narrative of his examination of these barrows, because there is an error in the number. At page 300 he says: "We then inspected a series of seven barrows, arranged in a line running north and south, and separated one from the other by an interval of about twenty yards. Our excavations were commenced on the eastern side of the fourth member (D) of the group (reckoning from the south)," &c. The fourth member of the group, reckoning from the south, is 61, as before; whereas he means No. 62, which is out over on the north side of the hedge. It is plain he does not mean the same barrow in both cases, because he designates one of them D, and the other E. Anyhow, we have come to No. 62, for I know them all. He asked me to come up when it was opened, and meet the Field Naturalists, who were to be there, but I was prevented on that day. Mr. Heineken and myself were there immediately after, whilst the trench and the kist-vaen were still open. It was a large mound of earth, with a kist-vaen built up of rough stones in the centre. Many traces of charcoal were mixed with the earth. I sketched the open kist-vaen stone for stone, standing on the north side, and at the north end of the trench, looking towards the south, and give it in the plate as the kist-vaen of No. 62. I then went down on my knees, and thrusting my arm and hand in as far as I could reach, felt about the dark corners for another cup. "Perhaps there's a snake in there," said Mr. Heineken. Didn't I pull my hand back! I felt nothing but fine soft black mould; and I regretted I had not got a trowel or a hand-digger to search more thoroughly. Something has always been forgotten. The calcined bones of an adult and those of an infant had already been removed; and Mr. Kirwan gives an engraving of what he terms a "bone bead" from the same place (*Op. cit.* iv. 301, and plate ii. fig. 2); but this does not resemble the objects now in the Museum, and which I give in the plate. The fine socketed celt was met with in the earth.

63. This tumulus, of which I give a view, was surrounded with a peristalith, or series of blocks of rough stones, at my first acquaintance with it. They were the common bleached

flints of the hill, about the size of a man's head or larger, and placed all round singly at intervals of four or five feet; not sunk in the ground, but laid on the surface, and clearly visible, as the herbage just at this place is mostly fine grass, devoid of fern and high furze. Geologically speaking, all this part of the county is composed of the New Red Sandstone, the upper member of these hills being red marl. Upon the red marl there rests nearly 200 feet of the greensand formation, consisting of beds of green and yellow sands and clays, alternating with numerous seams of chert. This is capped by a varying stratum of tough yellow clay containing quantities of white angular flints and chert. Much speculation has been advanced in order to account for the occurrence of this clay and flints. The large white stones of the peristalith came from that source; and so did the great stones, as well as the smaller, of No. 57; and so did the immense blocks, weighing several tons in weight, that lie scattered over the hills immediately overlooking Sidmouth, many of which have been removed to the river Sid, where they serve to fortify the banks, and where they can be easily examined. They are breccias composed of bleached pieces of chert and flint, mostly angular, embedded in a paste of grey or yellow clay, which clay has become silicified, and now is as hard, and takes as fine a polish, as the flints themselves. In accounting for the presence of this covering to the hills, some geologists have conjectured that the flints may be the sediment or remains of chalk outliers, as the pure chalk still exists a few miles south-east, at Beer; and that the tough paste may have been derived from the Plastic Clay beds above. Perhaps, however, I may suggest that the materials for this bed are to be found in the greensand below; and that if those materials were stirred up and washed about in a large body of water when the land was submerged, whether the clay and fragments of chert, so stirred up and the sand washed out, might not have settled again and formed this stratum which we now see resting upon the greensand in this neighbourhood. In some places, and in hollows, it is 50 feet thick. It not only caps the elevations, but there are indications of its lapping down over the slopes like a sheet; and there are two spots in the "Five Fields" leading to Bickwell, in the parish of Sidmouth, where it is met with in comparatively low ground. This looks as if it had once been continuous. Some have referred its origin to glacial action, like the boulder clay of other parts of England; first, because the long axes of the stones found in it are not coincident with the horizontal line,

as they would be if the settlement had been in quiet water; second, because no horizontal lines of stratification have anywhere been detected, either in the exposed sections of the cliffs, or in the gravel pits on Peak Hill, or elsewhere; and third, because where any markings or lines of discoloration have appeared in the cuttings, instead of being straight and horizontal, they are waving and crooked and contorted, as if the soft mass had been mashed up and squeezed together by snow or icebergs. These, however, are but negative reasons, and such theories require further confirmation.

The barrow No. 63 does not appear to have been disturbed. On paying it a subsequent visit, I am sorry to say that, some time during the winter of 1871-2, the whole of the stones of the peristalith had been removed.

64. A mound of moderate size still looking untouched.

65. A long heap of flints, lower in the middle. It is either a burial heap that has been disturbed, or perhaps not a barrow.

66. A small barrow of flints, the south half of which has been knocked about. I suspect it is one of the many that were hastily dug into in 1870 by Mr. Kirwan when the Field Naturalists were on the hill.

67. Of small dimensions like the former.

68. One more of the too many hurriedly attacked in 1870. It is of flints; the south side has been dug down and left as it was.

69. This was a cairn or heap of bleached angular flints, or more strictly perhaps of chert from the clay bed below. The stone implements that are to be picked up on these hills are rarely made of this material, because it does not split well; they are generally of the black flint from the chalk at Beer. This heap was entirely removed at some former period unknown to me, and nothing remains but a mere ring to mark its place.

70. This is a mound among the furze on the south side of the hedge, and the last of this extraordinary group.

71. A large and conspicuous mound nearly in the middle of the down, and marked on the Ordnance Map. It is 140 feet in diameter—the largest in this neighbourhood, and yet they all look so small out on the wild heath. No one would imagine their real size until they measure them, and until they calculate how much of their own lawn, or of their own garden, such a heap would cover. Just try, and you will be astonished. It has been disturbed on the top, but apparently no real examination has been made. One day Mr. Heineken

turned up an egg-shaped beach pebble on the crown of this tumulus with the point of his walking-stick. It precisely resembled the hoard of sling-stones packed away in a cave against the south agger of Sidbury Castle (which I was the first to examine on the spot, on Monday, March 28th, 1864, after some labourers had broken into the cavern, arched over with rough flints, and scattered them), and of which I brought away and still retain six—the most undoubted ancient sling-stones discovered in this neighbourhood. In the same simple way, on another occasion, he turned up a thumb-flint or circular scraper, or strike-a-light, of black flint, which is now, with others, in the Exeter Museum. A quantity of old dull green cathedral glass (so called), looking as if it had been the refuse from some dilapidated cottage window, supposed to have been thrown there by some village glazier after he had stripped away the lead, was also discovered here.

72. This is on the east of the road, and nearly opposite the last. It is 130 feet in diameter; the flat top, 70, and the slopes 30 each. Thus, $30 + 70 + 30 = 130$. It is slightly dished on the crown, as the section in the plate shows; or it may have been encompassed by a breastwork at the top of the slope, and, as suggested by Mr. Heineken, may have been a speculum or advanced post in connection with Farway Castle, and not a burial mound. He suggests, also that Nos. 24, 32, and 34, all large and high, and placed at commanding situations, may have been teut-hills or look-out stations. No. 72 is an interesting work, and does not appear to have been injured by any attempts at examination.

73. One of a group of three on the eastern side of the down.

74. Another, a few yards from the preceding.

75. The third of the group. They are small, and encumbered with a growth of heath and furze.

76. A small mound in the plantation.

77. This is also small, and it is somewhat doubtful in appearance.

78. This tumulus, or what remains of it, is in a field called "Stone Burrow Plot." The land is a portion of Lovehayne Farm, and belongs to the feoffees of the Poor Lands of Colyton. The earliest mention of this burial mound that has come under my notice is an entry in the diary or almanac of the late Mr. Matthew Lee, of Ebford, near Topsham, bearing date July, 1763. Mr. Lee was returning home on horseback, and he found men taking stones from this heap to construct the "new turnpike." This must be the present road running north and south over Broad Down, in the forming of which

Mint Scraper,
from N^o 71.



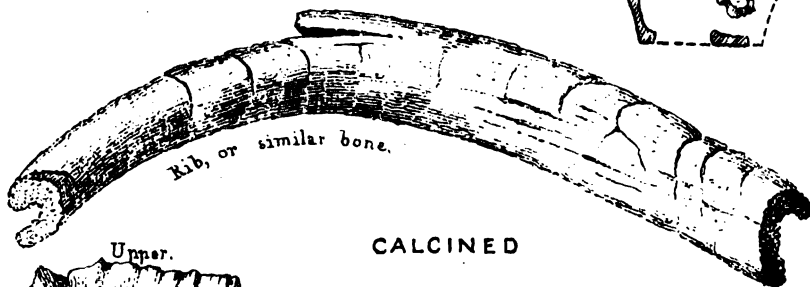
Section of
Flat Barrow
or
Speculum,
N^o 72.



Section of N^o 78.

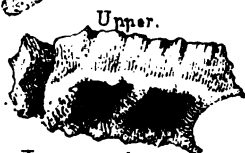


Fragments from 78,
suggesting
this form.



Rib, or similar bone.

CALCINED
HUMAN BONES
FROM N^o 78.



Upper.

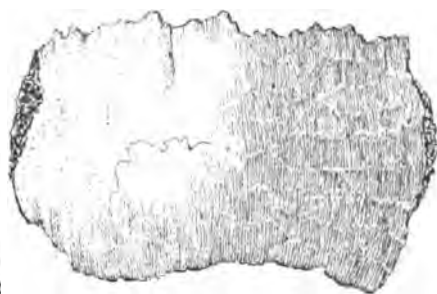
Jaw of Adult.



Lower.



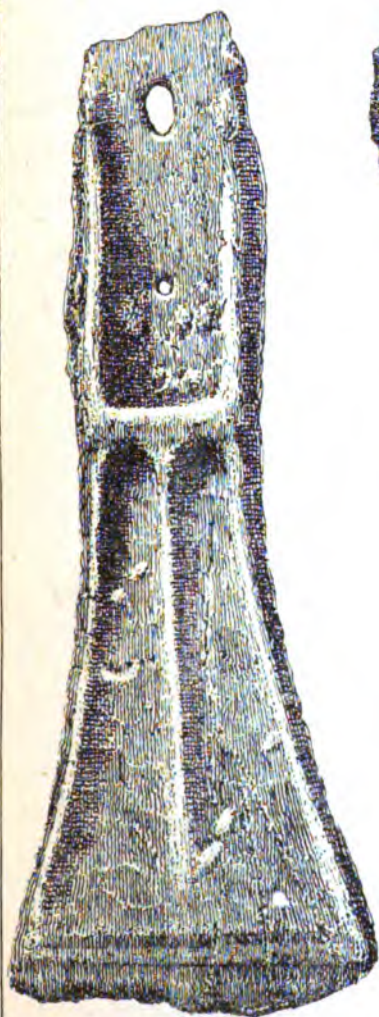
Left side lower jaw of a child,
full size.



Portion of Skull.

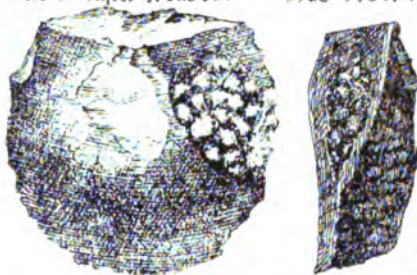
ALL THE BONES FULL SIZE.

Bronze Palstave.
full size.
from 78.

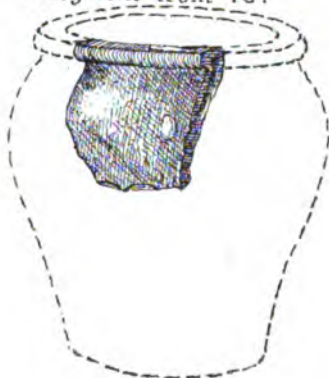


Flint Scraper from 78.

Side view.

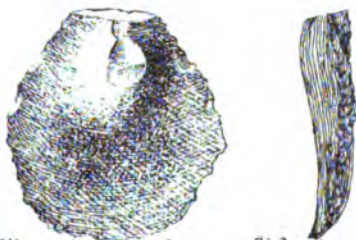


Fragment from 78.



Flint Scraper from
field near 78.

Side view.



the barrow No. 42 was cut through, as already mentioned. Mr. Heineken has furnished me with the following extract from his own memorandum-book :—"When at Ebford, May, 1862, Miss Lee found the following entry in her grandfather's (Matthew Lee's) almanac : 'July, 1763. The labourers on the new turnpike, to procure stone on Loven [Lovehayne] Farm, Culleton parish, near Southley, belonging to Culleton poor, found about 100 Roman chisels for cutting stone, of a metal between a copper and brass colour, rough as they came from the mould and unhardened. . . . I procured four of them.' . . . In May, 1861," continues Mr. Heineken, "Miss Lee showed me one of the celts, which was kept at the Hermitage at Ebford."

"On looking for it again, May, 1862, at the Hermitage, we could not find it."* Of the four palstaves taken by Mr. Lee to Ebford there remained only one and the fragment of another in 1861, and soon after which they were missing. Somewhere about 1870 I was enquiring of some labouring men near Otterton whether they ever dug up any antiquities in their work, or ever heard of any. One of the men replied that some brass tools had been found near Woodbury Castle, he believed. "Woodbury Castle," thought I, "is not very far from Ebford. This news is worth looking into." Further enquiry traced them to a Mr. Toby, a baker, who had removed to London. I got his address from his sister, Mrs. Drake, at Lower Pin Farm, near Otterton, wrote to him, found out that they were in his possession; but though he would not give them up, he said he would show them to me if I should come to London. An interval elapsed, when there came to Sidmouth Mr. Spencer George Perceval, of Severn House, Henbury, near Bristol.† He took the matter up where I had left it, and after a long correspondence, and much delay, he got Mr. Toby to send the objects down to Mrs. Drake. Mr. Perceval and myself walked over from Sidmouth, July 21st, 1877, and she finally gave them up to him. On showing them to Mr. Heineken he recognized them as undoubtedly to all appearance the same he had seen at Ebford. Mr. Perceval has since given them to the Exeter Museum, and much credit is due to him for his untiring perseverance in recovering them.

* This extract compared with my own memorandum, and found to be correct.—N. J. HEINEKEN.

† He is a grandson of Spencer Perceval, Chancellor of the Exchequer and Prime Minister, who was shot in the lobby of the House of Commons in 1812.

But besides those four taken from the barrow by Mr. Lee in 1763, a Mr. Snook, of Colyton (still pronounced Culliton by the country people), then bailiff to the Feoffees, who overlooked the labourers, took a few back with him to Colyton; and some of them, if not all of them, were said to have been put into the parish chest; but I understand that they have been lost sight of. One of them, however, Mr. Snook retained in his house, and by the year 1861 it had descended to his son and grandson, who were then living. Through the agency of a friend Mr. Heineken borrowed it, and on the 22nd of November that year I made a mould of it, and then several casts in lead, which I coloured green to look like bronze. Mr. Kirwan put one of these in the Museum, pending the real one, which the owner would not give up. Mr. Perceval again came to the rescue, and by once more exercising the same perseverance as before, he has ended by getting this one into the Museum at Exeter also.

I have dwelt rather long upon these palstaves; but as their descent can be so clearly traced, and their authenticity to my mind is so well established, the space taken up in the recital is not badly occupied. In 1861 it came to the knowledge of Mr. Heineken and myself that some building was about to be erected on Lovehayne Farm, and that they were going to attack this barrow for the sake of the stone. We thought it better to be present, and in October that year we went over twice. The section of the barrow (see plate No. 78) showed that it had consisted originally of a large heap of the usual white angular flints, covered over with about four or more feet of earth, apparently from the greensand. The trench which had been run into it in 1763 was clearly visible in the middle. The flints below had been disturbed, and when the materials had been put back, earth and stones had been thrown in promiscuously together, as shown in the middle of the section. These bronze implements formed no part of the original interment, nor indeed of any interment at all. They constituted the hoard or stock-in-trade of some bronze-caster, as was indicated by their untrimmed condition, as well as from their great numbers, as if they had not yet been used or passed into circulation, but had been buried there temporarily for safety. Mr. J. Snook, son of the first possessor, writing to Mr. Heineken in reply to his enquiries, says there were "half a wheelbarrow full." In a second communication he uses the words, "About fourscore;" and he adds that "they were sold at Honiton for old metal." Mr. Per-

ceval finally got the Snook palstave into the Museum from the widow of the grandson of the first owner, and it is this one that my sketch in the plate represents. In vol. ii. page 647 of the *Transactions* Mr. Kirwan speaks of this find; and referring to Davidson's *Notes on the Antiquities of Devon*, page 73, quotes these words within inverted commas, "Bronze spear-heads, amounting to half a wheelbarrow full." On turning to Mr. Davidson's book, page 73, I see his words are very different. They are, "A large number of spear-heads of mixed metal." Lower down he gives the statement from Mr. Lee's Almanac, which he obtained from Mr. Heineken, and it is placed within inverted commas; but the words do not tally with the version I have given above. At page 300, vol. iv., he describes the finding of the socketed celt in barrow No. 62, which showed signs of wear; and comparing it with another socketed celt which he procured in Honiton, he says, "The same is also the case with the other celt of similar type obtained in Honiton, and supposed to have been originally brought from Lovehayne, near Broad Down." We have no right to hint that this celt, accidentally procured in Honiton, ever had any connection with the hoard at Lovehayne, for we know nothing of its history; and if we do not guard ourselves against suppositions and assumptions of this kind, there is no end to the errors we may run into. We have traced the pedigrees of the Lee palstave with the fragment, and of the Snook palstave, "from the earliest times down to the present day," as the historians say, and I have every confidence in their authenticity; but good-bye to all confidence if we write history upon supposition.

Well, so much for bronze implements. From first to last Mr. Heineken and myself have visited this barrow more times than I can now enumerate, never missing an opportunity of turning aside to have another look at it whenever we have been in the neighbourhood of Broad Down. By my *Diary*, however, I see that it was on September 19th, 1859, and in October, 1861, that the chief diggings took place. From 1763 down to that date occasional spoliations had taken place, but at this time the destruction was well-nigh completed. How many loads of flints, or scores of loads, had been removed I know not; but in the five days from the 24th to the 29th of October, 1861, the labourers took away thirty-two. In constructing the barrow, which was 70 feet in diameter, a depression had been made in the centre, where a rude pavement had been laid down, and the primary interment of a rude vase, containing the calcined bones of an

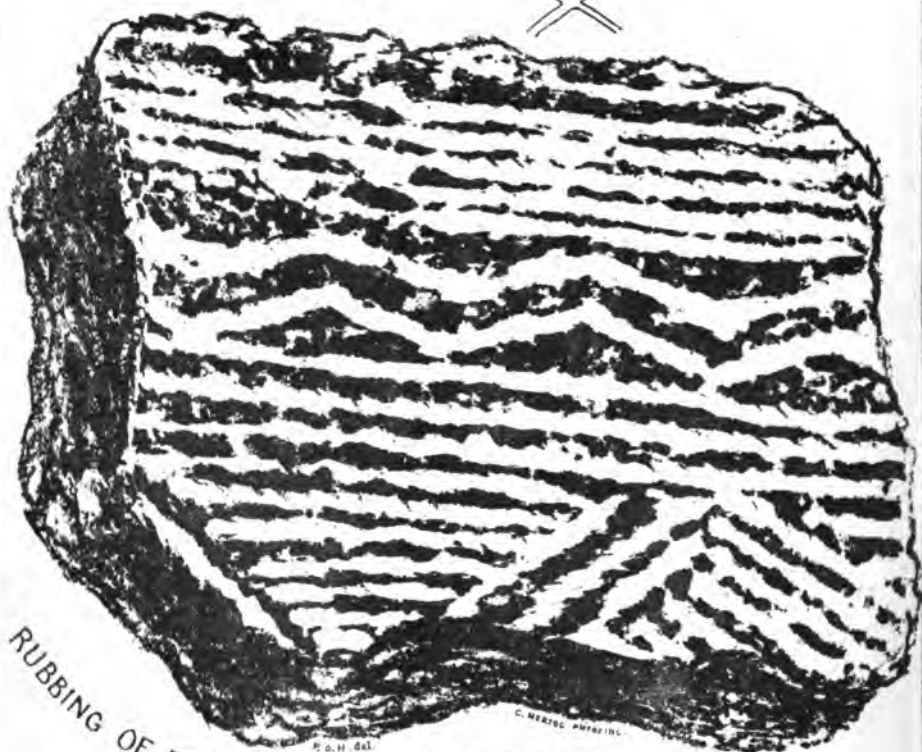
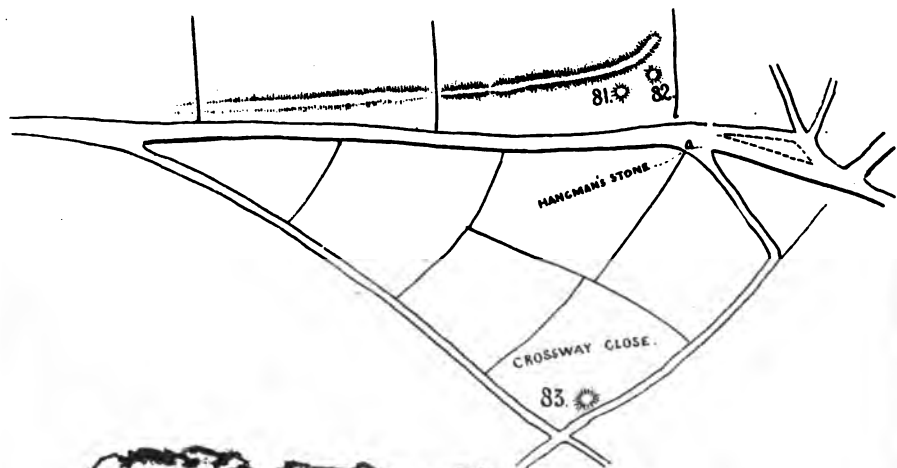
adult and a child, had been deposited. Over this was a cairn of about 4 feet high, and this latter was buried under 4 or 5 feet of earth. We directed the men in their approach to the centre. The vase had been broken, either by the weight of the stones or by depredators, and we only found a few pieces. Some traces of charcoal presented themselves, but not many. A great many pieces of burnt bone were collected, the best of which are given in the plate. We met with one piece of pottery, of better quality than the former, in which we believed the bones had been, and which had a spot of green glaze on the side and another on the top. It was about half-an-inch thick, and forms part of the second vase from 78. A portion of a third vase, of coarse pottery, nearly two inches square, and only three-sixteenths of an inch thick, was also met with and saved. These things have been sent to the Exeter Museum. Great part of the earth of this barrow was strewn over the field, but a large heap still remains. At a subsequent visit I picked up a sling-stone on this heap, but it was a stone from the distant Budleigh pebble-bed; and Mr. Heineken, with the point of his stick, turned up a thumb-flint scraper, or strike-a-light. It is a thick specimen, and in splitting the flint the maker broke into a cavity full of the mammillations of chalcedony. I found another soon after in the field between the barrow and the road.

79. A mound in the interior area of Blackbury Castle, towards the south-east side.

80. A similar mound close to the former. Without examination it would be impossible to say exactly what they really are; but it is well to put them on record.

81. In a field now called "Twelve-Acre Field," which has only been brought into cultivation within recent times, there are traces of a long earthwork and two barrows. No. 81 is twelve paces in diameter, of no great elevation, and mostly made up apparently of stones.

82. This lies a few yards eastward of the former. They are immediately opposite Hangman's Stone. Driving by that way one day with Mr. Heineken to explore the country further eastward, and seeing some men ploughing, his attention was called to a long ridge of the yellow clay of the subsoil running across the field nearly parallel with the road, and which was afterwards found to extend itself westwards into the adjoining fields. It was very apparent across the black mould. Subsequent examinations showed it to be a very interesting work, never noticed before; for it was evidently some bold line of defence in connection with Black-



RUBBING OF FRAGMENT OF CROSSWAY CLOSE URN. N^o. 83.



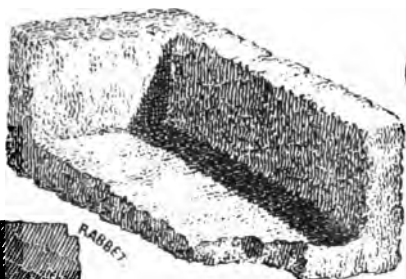
bury Castle and the Cross Dyke at the Three Horse-shoes wayside inn; or, considering that all the roads from the coast on the east and south converge upon this point, it is a work that some invader who had attained so far in his approaches to that camp had thrown up, for the purpose of protecting himself from an assault in that direction. The ditch was on the east side of the Cross Dyke, and on the north side of this earthwork, whatever that may mean. The plough passes over these two barrows nearly every year, but I believe that no attempt at excavation has been made. A plan on a larger scale is given in the plate, easily found by their numbers.

83. About 1850 some men were ploughing in a field called "Crossway Close," when the plough caught some stones, probably of some kist-vaen, and broke a large sepulchral urn, containing calcined bones. Mr. Stoodleigh, of Higher Watercombe, close by, told Mr. Heineken and myself, and showed us the spot. The labourers carried away the pieces, and they were all lost, except one, which Mr. Power, of Elverway, secured. He would not give it, but he lent it to Mr. Heineken. From this I made a mould and several casts, and returned the original. Some ten years after this, being near Elverway, I called and asked him for the fragment; but though he searched about, he could not find it. He was an old man, and is since dead. He had better have given it at first. It measured three inches by four, and was nearly an inch thick. In colour it was reddish-brown, and it was thickly ornamented with a pattern produced by a twisted cord. The inside slope of the top edge was set off with four parallel lines of the twisted cord. Judging by this segment of the curve, it must have been near half a yard in diameter. It would have been a splendid urn had it been recovered whole. A rubbing of my cast is given in the plate.

84. Between three and four miles east of Sidmouth, on a farm called Bury, there is a quadrangular camp, whose south side abuts upon the edge of the cliff. It is nearly 1000 feet long and 350 wide. On the plain, covered with fine grass, that stretches away westward of it, there lie, scattered about within fifty yards of the cliff, twelve or fourteen heaps of stone. In our visits to the camp, Mr. Heineken and myself had often contemplated these mounds, but considered them only as "clearance heaps," commonly so called. Where the farmers are much encumbered with loose stones, they frequently collect them, and throw them in a corner of the field, or anywhere else out of their way; and as the land is all under cultivation

a few score yards from the cliff, it seemed reasonable to suppose that these were merely heaps of the flints that they had thrown there to get rid of. A short distance to the west of the camp lie three great blocks of stone, under which treasure is concealed, according to the belief of the country people. In advance of these is a circular mound 62 feet in diameter; then a mound slipping over the cliff; further in there is a long narrow heap, 50 feet in length; then four small round ones; then a larger conical one, 40 feet in diameter, and seven high. This is No. 84, which we attacked September 8th, 1858. Further west are two circular heaps; then a long heap, having its greatest axis parallel with the edge of the cliff; then another long one, with its greater diameter at right angles to the line of cliff; and then two round heaps. All of these are within a quarter of a mile of the camp. Mr. Heineken remarked, however, that some of these were covered with a foot thick of good mould; and as it seems unlikely that any farmer would cover a mere refuse heap with earth, it might be inferred that possibly these may be designedly made burial mounds after all. Their proximity to the camp, moreover, may suggest that some deadly struggles may have taken place here. The opening of 84 (which is the only one I think it necessary to number), did not produce any results. The fine turf and the earth were removed from the top, and the labourers descended down to the ground line. The work was most difficult. All the interior was composed of loose dry flints, and as fast as any were removed the sides slipped down, and threatened to bury the men. Only standing room for one man was laid bare at the floor, although the top was completely open. Nothing but the removal of the whole heap would have proved whether it was a sepulchral mound or not.

85. About the commencement of the present century a stone coffin was discovered in a field called Littlecombe Three Acres, near Bury Farm. There may originally have been a mound over it, but as the land has been from time immemorial under cultivation, nothing on that point can be ascertained now. A loaded cart was passing through the field, when one of the wheels broke the cover of the coffin, which was only a few inches beneath the surface of the ground. This led to an examination, when the skull and some of the larger bones were taken out, and, as it was said, carried to the vicarage at Branscombe, and afterwards buried in the churchyard. Twenty or thirty years after this the tenant of Bury Farm, having a superstitious dread of the spot, wished that the coffin and its contents should be



STONE COFFIN.



RABBIT

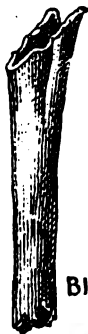
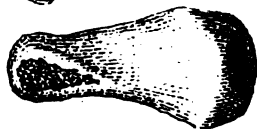
METACARPAL—BACK OF THE HAND.



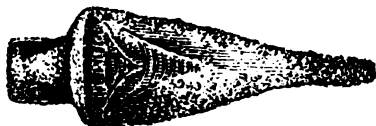
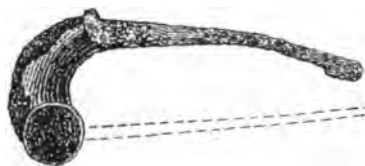
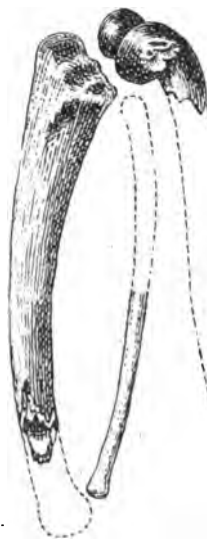
FINGER.



TOOTH.



BIRD'S BONES.



BRONZE FIBULA.



IRON NAIL.

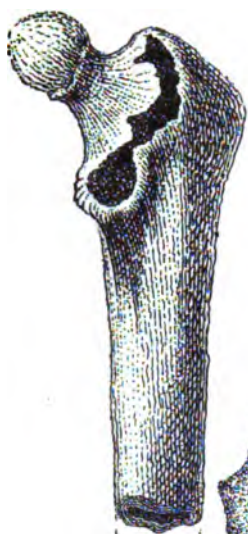
entirely removed. Report declared that a ghost, under the form of a lady with an old-fashioned head-dress, and long pins stuck through her hair, used to sit upon the stile in the dusk of the evening, so that the good people of the neighbourhood were afraid to go by. Some more of the bones were carried away, and then for many years the subject dropped. Having heard of these things, Mr. Heineken and myself resolved to have an examination; but as the acts of spoliation had been rather numerous, we entertained small hope of finding anything. It was so long ago as July 27th, 1857, that we commenced operations. The top edge of the coffin was only six inches under the turf, there being no lid at all. It lay nearly north and south; or rather, what we took to be the head end, inclined about fourteen degrees to the west of north. The coffin had been made of one block of Beer stone from the subterranean quarries, or from the quarry, on the cliff at Branscombe, now worked out. These quarries furnish a hardish chalk rock that has been much used in house and church building from the earliest ages. The coffin was all in fragments, except a portion of the head end, two feet ten inches long, and this had the right side broken out. It had been about seven feet long originally, and was eleven and a half inches deep. The sides were from three to four inches thick. One large piece had a hole nearly an inch in diameter through it, such as stone coffins sometimes have in the middle of the bottom. The work was of a very rude nature, except a rabbet round the top edge, the point of the pick being visible everywhere, both inside and out. Of the cover we saw nothing that we could identify; but from the rudeness of the whole construction it is not likely that any inscription had been cut upon it. We took the contents out carefully. Nearly all the earth passed through our fingers, or was examined by a rake, which we had with us for the purpose. We collected about thirty pieces of unburnt bone, the best of which were one or two joints of the finger, a metacarpal of the back of the hand, a tooth, and some others. Besides the human bones, we collected from the interior of the coffin, and evidently buried with the others, several of the bones, or portions of the bones, of a bird about the size of a rook or pheasant. We also met with an iron nail, and a bronze fibula, minus the pin. These objects have since been sent to Exeter. We replaced all the fragments of stone, filled in the earth, and relaid the turf. This coffin lay in a field on the south side of the lane leading to Branscombe, out in the open country, and remote from

every habitation. It has been suggested that the fibula resembles Roman work, and the position of the coffin not Christian burial. The nearest habitation is Bury Farm, nearly half-a-mile east, and perhaps a Roman villa occupied the site of the old farm-house, though nothing but examination would prove it; and then there is a quadrangular camp on the edge of the cliff, at about three-quarters of a mile to the south-east, which some incline to think Roman from its shape. These, however, are mere speculations; and these we admit not in this matter-of-fact account. Somewhere about 1874 the place was rifled again, and all the stone we had left carried away to repair a wall.

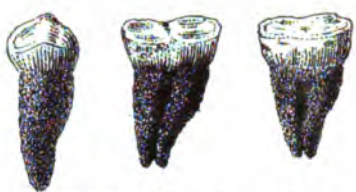
86. Near the carfoix a little to the south of Higher Bulstone, on the Branscombe side of the lane, a labouring man is said to have broken into a sort of kist-vaen made of slabs of stone, and containing bones. No enquiry on the spot, however, has succeeded in obtaining any definite information on the subject.

87. Somewhere about the year 1850 two labourers, named Gosling and Bond, were employed to make a limekiln at a spot about 200 yards east of the ruins of old Dunscombe Manor House, two miles north-east by east from Sidmouth. The place was near the head of a romantic combe opening to the sea. In digging down the bank the men broke into a sort of cave, in which were the bones of a person lying in a contracted position, encumbered and covered with blocks and pieces of the yellow sandstone of the district, belonging to the greensand formation. The men were too indistinct in their description to convey any clear idea of the attitude of the skeleton. No vestige of clothing, ornament, or weapons came to light. Gosling told me some years afterwards that most of the bones were taken to Miss Leigh, at Hill's Cottage, near Sidmouth, who owned the Dunscombe property; that some of them fell to pieces; and that the skull was buried in her garden, and the remembrance of the locality lost. Mr. Heineken has three of the detached teeth, the crowns of which are much worn by mastication. I got portions of leg and other bones, with part of the left side lower jaw with four teeth in their places, which I sent to Exeter. This was an interment without cremation, but under what circumstances it is impossible to say. The bones adhered strongly to the tongue, and there was every appearance of great age about them.

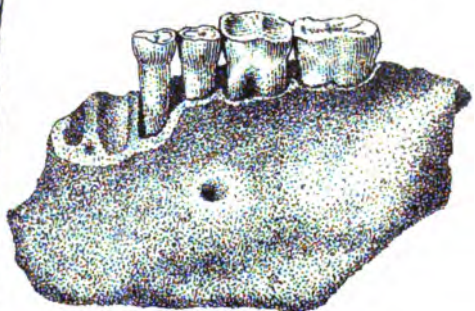
88. A circular patch on the open heath, from which the flints of a cairn have been entirely removed. A partial



LEG
BONES
FROM N^o. 87.

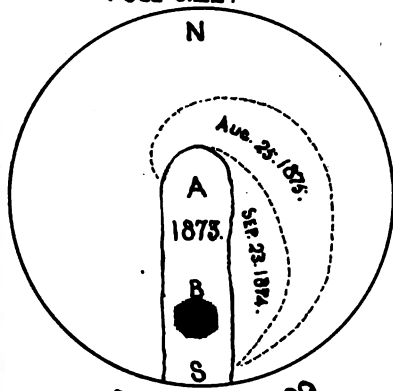


TEETH FROM N^o. 87.



LEFT SIDE OF LOWER JAW,
TAKEN FROM N^o. 87.

FULL SIZE.



PLAN OF N^o. 89.



SECTION OF N^o. 89.

digging on the natural surface in the centre failed to discover any traces of an interment beneath the surface.

89. A cairn of dry white angular flints a few yards south of the preceding. It is on the brow of the hill overlooking the valley of Sidmouth. At some former period it had evidently been tampered with on the crown. June 6th, 1873, Mr. Heineken and myself made our first attack upon it. A trench was begun at the south margin, and carried beyond the centre. It was evident that the middle portion had been invaded from the top, and possibly the objects for which we were looking had been extracted; for nothing was met with in that quarter. There appeared to be a sort of floor made of larger flints than the rest of the heap; and one of our friends who had now joined us picked up an oviform beach pebble sling-stone in the trench at A. At first we thought this was an important find; but though it was found in the centre of the barrow at the bottom of the trench, it may not have been placed there at the time the barrow was made, but may have got in there from the top when the mound was tampered with; or indeed it may have rolled down from the upper surface whilst we were there ourselves; for it will be observed whilst making an excavation, that as fast as the materials are shovelled away from the bottom, the sides and upper portion are always sliding down. The finding of it in that place consequently proved nothing. Such beach pebble sling-stones are to be found scattered over the hills for many miles round this district, and very far inland, and must have been in very general use, not only for purposes of war, but also for purposes of the chase. Rabbits, and even birds, were probably aimed at on these hills. Another kind of sling-stone is not infrequently found here, though it is not so common. This is the worked sling-stone or hand missile manufactured out of flint stones. Such objects are discoidal or conical with a flat bottom, or irregularly jagged into sharp edges and points. One of these would not only give a very severe bruise, but would also inflict a very dangerous cut. I have laid some stress about the meeting with the sling-stone in the barrow, because a point in archaeology is involved in it. Some of our best students are of opinion that the ancient Britons before Cæsar's time had no knowledge of the sling. We know that the Romans, Saxons, and the other nationalities that followed them, were familiar with its use. But whilst we have no proof that the Britons used the sling, we have, on the other hand, no proof that they did not. The question therefore is an open one, and it cannot be settled until we find a sling-stone

in a barrow of undoubted British construction, and it must be absolutely within the sepulchral urn, along with the remains of the deceased, or it cannot satisfy all the requirements. Well, to return. In and under the rough pavement of the floor, not at A, but some feet south of the centre at B, we met with a deposit of charcoal two or three inches thick; and as it only covered a space of about two feet in diameter, it looked as if the embers of the fire had been swept together in a heap. The charcoal was that of oak and fir—two species of tree scarcely known in this neighbourhood now. The elm is the common tree in the valley of Sidmouth, whilst the ash abounds at Salcombe and Honiton, and Harpford Wood is of beech. Considering how very generally we have detected oak charcoal in most of the ancient deposits that have come under our notice, it is hard to resist the conviction that at some remote period the oak must have abounded plentifully in this district. A large Budleigh pebble of the Devonian or Silurian age, and not a Sidmouth pebble, which would have been flint or chert, was met with near the charcoal, which had lost two pieces split out of the side as if by heat. Two small white quartz pebbles, also from the Budleigh bed, turned up, one being an inch across and a quarter inch thick, and the other spherical, about half-an-inch in diameter, blackened on one side as if by the fire, and with a small splinter detached. The occurrence of such pebbles in burial-places and kitchen-middens in widely separated localities has given rise to some speculation, certain persons imagining that they may have been used by children or others in some game, but the question is still undecided. Mr. Kirwan and myself in 1871 met with two or three in the refuse heap buried in the agger of the camp on High Peak Hill, a mile and a half west of Sidmouth, which were sent to Exeter along with the bones. No osseous remains could be detected with the charcoal. At a subsequent examination there in 1874 we met with a pebble-stone hammer, as was apparent from the bruises at one end. Several of the like have been picked up on these hills. And at a further attack in 1875, a jagged flint missile, and some smooth sling-stones.

90. This was a cairn of dry flints, disturbed and nearly removed, I believe, in 1851, at the time that the top of Salcombe Hill was enclosed. It is over the hedge, just at the turn of the road, on attaining the level. It is still possible that the kist-vaen may be there somewhere.

91. When the field in which 91 stands was first ploughed up, after the land had been enclosed, there was a slight eleva-

tion at this place, with a greater number of flints than elsewhere, suggesting indications of a small barrow. Many surface examinations, however, and even raking the place over with a garden rake, failed in making any discovery.

92. This is a mound of stones lying in a hollow close to the hedge by the roadside. It may be a clearance heap, but it looks very like a cairn.

93. This was one of the largest stone heaps in the neighbourhood. It had been frequently despoiled for the sake of the stones, but no proper examination made. It was not wholly removed till the summer of 1878. Mr. Charles Maer contracted with the Burial Board to make the road leading up to the new cemetery, and he employed the stones of this cairn in making the foundation of it. He told me he took away more than 250 cartloads of flints from that spot. I could not learn that any archæological discovery was made, but no one was there to look after the men.

It is very possible that there are still more burial mounds on the hills that surround Sidmouth which I have overlooked. Amongst the fern and the furze bushes they are not always easy to find. It is to be hoped that the gentlemen on whose land such objects are to be found will never allow them to be touched, except under two or three stringent conditions. First, that the person to whom permission to dig is granted shall be possessed of sufficient archæological knowledge to conduct the work properly; secondly, that he shall be prepared to take notes, sketches, or photographs of all things of interest during the progress of the operations; thirdly, that he never leave the workmen to themselves on any account whatever; fourthly, that only one barrow be taken at a time; and fifthly, that all objects found be carefully transmitted to the owner, or conveyed to some good museum. The best plan, however, would be to entrust such a work to a committee of gentlemen selected from the members of the Devonshire Association.

P. O. HUTCHINSON.

FIRST REPORT OF THE COMMITTEE
TO OBTAIN INFORMATION AS TO THE PECULIAR
TENURES OF LAND,

AND AS TO CUSTOMS OF MANOR COURTS, IN DEVONSHIRE,
EXCLUSIVE OF DARTMOOR.

FIRST REPORT *of the Committee—consisting of Mr. G. Doe,
Mr. R. Dymond, Mr. A. W. Hurrell, Mr. G. W. Ormerod,
Mr. J. Brooking Rowe, and Mr. Edward Windeatt*
(Secretary)—*on peculiar tenures of land in Devonshire.*

Edited by EDWARD WINDEATT, Hon. Sec. of the Committee.

(Read at Totnes, July, 1880.)

YOUR Committee regret that they have as yet been able to obtain so little information on the subject for which they were appointed; they, however, consider it would not be right to any longer delay their first report, and they trust that its publication will lead members of the Association to supply them with many valuable notes bearing on their especial work.

It is evident that every year customs of manor courts and the courts themselves are dying out, and peculiar tenures of land are forgotten; and it is therefore most desirable that all that can should be gleaned on these subjects.

Your Committee do not propose to confine themselves to peculiar tenures still existing, and manor court customs still observed, but will endeavour to obtain and record notes of such as are not now known to exist or be observed.

The Committee regret that the definition of Dartmoor prevents their giving notes on the manor courts of Ashburton and Buckfastleigh.

The contributor's name is appended to each note.

ROBERT DYMOND, Chairman.

EDWARD WINDEATT, Hon. Sec.

TORRINGTON COMMONS—QUIET POSSESSION.

The town of Great Torrington has long been noted for the extensive commons around it, and for the tenacity with which the inhabitants maintain their commonable rights, and the jealousy with which they view any attempt to encroach on them. The earliest document referring to the grant of these commons with which I am acquainted, is a Decree in Chancery made in the 42nd year of the reign of Elizabeth (1600), from which it appears that "One William, sometime Lord of the town and burrough of Torrington Magna, by his deed did assure unto the free burgesses of the said town, and some others of his free tenants of his manor dwelling in the parish of Torrington Magna aforesaid, common of pasture for their beasts and cattle in and throughout his waste grounds within his manor of Great Torrington, lying within the aforesaid parish." Risdon in his *Survey of Devon*, completed in 1630, says, "For their" (the poor's) "better relief, William Fitz-robert, Baron of Torrington, in King Richard the first's reign, gave them a large waste called the common."

The unenclosed commons now consist of about 370 acres, over which all "occupiers of ancient messuages" (vulgo "pot-boilers"), claim the right to common of pasture without stint.

Besides these open commons there are certain "common fields" in the parish, containing about 163 acres, over which the same commoners claim similar rights, subject, however, to a right of tillage, belonging to the lord of the manor or other owners of the freehold. The gates of these fields were removed annually, after harvest, and the land was stocked with cattle from the adjacent open commons until the customary time for the next year's tillage. This practice continued until the year 1835, when the occupiers of the common fields agreed to pay "quiet possession" rents, in consideration of their being allowed to cultivate the fields in what manner they might think proper, and at a public meeting of the inhabitants, a committee was appointed "to receive such rents and apply them as they might consider best to promote the interests of the inhabitants." The agreement is renewed every seven years, and the committee re-appointed every three years, and the rental, amounting to £30 3s. 6d., is generally applied in the purchase of coal and provisions for distribution amongst the poor inhabitants of the parish.

The minute-book of the Quiet Possession Committee shows that on the 30th May, 1843, some of the rents being in arrear, it was resolved that the fields of one of the defaulters should be stocked on the 1st June following, at ten o'clock precisely, and a sub-committee was appointed to carry the resolution into effect. "The pig-drivers to drive the commons in the morning to get the cattle together to stock the fields with." The minute further records that on the 1st June the above resolution was carried into effect, as the commons were then driven and the cattle thereon turned into the fields of the defaulter. He having refused to comply with the above resolution, the said cattle remained in the fields until the evening of the same day, when a note of hand was given for the amount due.

In the year 1874, the occupier of one of the common fields having neglected to keep up his fences against the open commons, some of the commoners broke the fence of the field and depastured cattle thereon. The tenant thereupon brought an action of trespass in the county court, at the hearing of which it was proved that he paid (in addition to his landlord's rent), the stipulated quiet possession rent to the Secretary of the committee. The judge, Serjt. Petersdorff, gave judgment for the plaintiff, and intimated that "if the payment of the rent to the committee had any legal result, it would be to increase the defendants' liability and aggravate their conduct, instead of justifying their aggressive entry." GEO. DOE.

CASTLE GARD.

Westcote, in his *View of Devonshire*, writing of Torrington Castle, says, "Of which much good land is held in Castle Gard." Several acres of the best land in the parish of Great Torrington, lying contiguous to the site of the Castle, of which not a fragment remains, are now known by the name of "Castle Garden," and are evidently the land held by the ancient tenure mentioned by Westcote. The Rev. Dr. Colby, F.S.A., in his *History of Great Torrington* (printed in vol. vii. of the *Transactions* of our Association), professes to quote from Westcote thus: "Much good land is held in the castle yard." It would seem that the Doctor, thinking that either the learned editors or the printer had misunderstood Westcote, hit on his happy emendation as a means of throwing light on the obscure passage. GEO. DOE.

SLAPTON MANOR.

The following account of a peculiar tenure is from *Fragmenta Antiquitatis, Antient Tenures of Land, and Jocular Customs of some mannors, made public for the diversion of some and instruction of others.* By J. B., of the Inner Temple, Esquire. Published in 1679. It is evidently an abridgement of a full account in Izaack's *Antiquities of Exeter* :

"*Hugh Courtenay*, Esquire, son and heir of Sir Hugh Courtenay, Knight, held the mannor of Slapton, *in com.* Devon, of the Bishop of Exeter, by the service of being steward at the installation feast of every Bishop of that See. The particulars whereof were, after some controversie thus ascertained by Walter Stapleton, then Bishop of Exeter, and his Dean and Chapter, under their seals, at Newton, Plympton, the morrow after the feast of St. Thomas the Apostle, *anno dom.* 1308, 2 Edward II. The said Hugh or his heirs, shall at the first coming of the Bishop of Exeter, meet him at the east gate of the city, when he descendeth from his horse, and then going a little before him on the right hand shall keep off the press of people, and attend him unto the quire of the Cathedral Church, there to be installed. And shall at the installing feast serve in the first mess at the Bishop's own table. In consideration of which service the said *Hugh Courtenay* and his heirs shall have for their fee four silver dishes of those which he shall so place at the first mess : two salt-cellars, one cup, wherein the Bishop shall drink at the meal, one wine-pot, one spoon and two basons, wherein the Bishop shall then wash. All which vessels are to be of silver. Provided the said Hugh, or his heirs being of full age do attend this service in person, if not hindered by sickness or the king's writ, &c., then to appoint some worshipful knight to supply the place by a deputation, who shall swear that his lord is sick, &c."

EDWARD WINDEATT.

BEATING THE BOUNDS OF THE ERME.

The following very interesting account of the revival of an old custom of a Devonshire manor court appeared in the *Western Morning News* of September 9th, 1878 :

"On Friday, an ancient and somewhat interesting and exciting custom was observed ; viz., a perambulation of the bounds of the river Erme, from its head to the mouth, including

what is known as Erme Plains, a piece of moorland belonging to the lord of the manor of Ermington.

"This is done for the purpose of asserting and maintaining the right of free fishery throughout the river, and of pasture on the moor.

"The first record of the perambulation is in the year 1603. It was customary for a very long period to make the perambulation every seven years, but the last time it was made was in July, 1859, rather more than nineteen years ago.

"The late owner (Mr. Splatt), during the thirteen years of his ownership, did not care to keep up the custom. In March of last year Mr. Mildmay came into possession of the property, and, judging from the cheerfulness depicted on the faces of all those who took part in it, the tenantry will hail with delight a return to the old custom. Fortunately the day was all that could be desired, and a very large number were seen in the morning, some walking, but nearly all riding, making their way towards the moor. The first thing was to get to the head of the river, about eleven miles above Ivybridge. There could not have been less than three hundred persons started, but few, comparatively, went to the extreme point. Arrived at this point, the net was cast into the river and drawn, and the following proclamation read :

"Manor of Ermington.—All persons whom it may concern take notice, that a perambulation of Erme Plains—on which the tenants of this manor have a right of common pasture—will this day be made, by order, and on behalf of the lord of the said manor, according to the bounds and limits following ; viz., beginning at a small heap of stones near Left Lake Head, at the end of the ridge of stones which proceeds north-west from the middle borough of three boroughs, thence by several bound stones and a ridge of stones to outer Whitborough, passing a little to the south-west of the cross called Peter's Cross, and so on to Abbot's Way, otherwise Jobber's Path, and from thence to Red Lake Head, and by the same lake to the river Erme, thence by the said river to the foot of the Left Lake, and thence by the same lake to its head, and so back to the small heap of stones first above mentioned. Take notice further that, by the same authority, it is also intended to view the said river Erme from its head to the sea, and to fish therein and do other acts in order to assert and maintain the right of fishery, and other rights belonging to the said manor of Ermington. And be it known that the lord of this manor asserts as belonging to in respect thereof a right of free fishery in and throughout the said river, and that it is intended on this occasion to use a net and other means for taking fish therein for his use, in order to maintain such right. And that he also asserts the like right to all wreck and goods found,

either jetsam, flotsam, or ligan, within the said river, and from the mouth thereof seawards as far as an umber or tar barrel can be seen.'

"This proclamation was read at several points on the river; the last at Mothecombe, where it empties itself into the sea. After the net had been drawn several times, and the party had lunched on the moor, they proceeded to Ivybridge, where their arrival was looked forward to with great interest. Just after three o'clock the net was drawn directly under the 'Ivy' bridge, and the right of landing the fish on the west side of the river was, in a good-humoured way, denied by a representative of Lord Blachford. Here the inhabitants were treated with a little fun (except for those who were the victims, although they seemed to enjoy it) in the shape of pulling two or three into the river, and giving them a thorough bath. This was repeated about fifty or sixty yards down the river, to the great amusement of the onlookers.

"The party then proceeded to Keaton, where Mr. W. Pearce denied them the right of passing through his ground by locking the gates, thus compelling them to force an entrance in order to get to the river. Seven individuals, however, climbed the gate, Mr. Pearce protesting, and the net was again drawn. Thence the party, consisting principally of Mr. Mildmay's tenants, rode and drove direct to Mothecombe, through the magnificent grounds of the Flete Estate. Here the Modbury band joined the procession, and on arriving at Mothecombe beach were very cordially received by Mr. and Mrs. Mildmay.

"A very picturesque scene here presented itself. Flags were flying, the band played some good selections of music, hundreds were on horseback, and a large number of the inhabitants had collected to witness the proceedings. A net was cast, fish caught, two or three persons enjoyed themselves by giving each other a bath, this time a salt-water one, and after three cheers for Mr. and Mrs. Mildmay and family, and Mr. and Mrs. Bulteel, they dispersed." EDWARD WINDEATT.

FIRST REPORT OF THE DOMESDAY BOOK COMMITTEE.

Mr. J. S. Amery, Mr. J. B. Davidson, Mr. G. Doe, Mr. R. Dymond, Ven. Archdeacon Earle, Rev. W. Harpley, Mr. J. S. Hurrell, Mr. P. O. Hutchinson, Mr. J. Brooking Rowe (Secretary), and Mr. R. N. Worth.

(Read at Totnes, July, 1880.)

THE Committee begs to report that the work which it has undertaken has steadily progressed, and that the whole of that part of the Domesday Book which relates to this county has now been extended and transcribed, and a translation made. This applies to the Exeter as well as to the Exchequer Book.

The next step, that of careful revision, is a most important one. As a preliminary, it has been decided to bring the whole of the translations into harmony, and this task has been committed to Mr. R. N. Worth and the Secretary. After this has been done, the sub-committee for revision, Messrs. R. Dymond, J. B. Davidson, P. O. Hutchinson, and R. N. Worth, will undertake the work of correction and final revision. This will occupy some considerable time, and it is impossible at present to fix any period for its completion.

The annotation, identification of names of persons and places, statistical tables, &c., will then have to be proceeded with.

It will be apparent to the Society that the question as to how the MS. is to be printed is a serious one, and one requiring much consideration. As to this, however, the Committee will report at some future time.

ROBERT DYMOND, Chairman.
J. BROOKING ROWE, Hon. Sec.

AN HISTORICAL SKETCH OF TOTNES.

BY E. WINDEATT.

(Read at Totnes, July, 1880.)

THE early history of this ancient town is, to a great extent, involved in obscurity, but there is little doubt that it was one of the earliest towns in Devon, if not in Britain.

Standing as it does ten miles from where the Dart flows into the sea, and so removed beyond the reach of pirates, who would plunder towns on the coast and quickly escape; and occupying a central position in the district, it is situate just where in very early days a town would have been planted; and we should have to go back to very remote times to fix the date of its foundation.

At an early period the tin of Dartmoor was worked, and the ships of traders came over to convey it to the neighbouring continent; and very much tin must have been exported from Totnes before the appearance in the West of the legions of Vespasian. It is presumed that even those who might be inclined to discredit the tradition that Brutus landed at Totnes (notwithstanding, in Fore Street, the very stone on which he is said to have landed can still be pointed out), would admit that there was some good foundation for the belief that Vespasian landed at "Totnes shore" and marched from thence to the siege of *Caer Pensaulcoit*. It is true that a writer has recently attempted to dispute this; but most persons will agree with the review of that work in the *Athenæum*, that the main difficulty in the way of his theory is the want of evidence to support it.

It is clear that *litus Totonesium*, or "Totnes Shore" or strand, applied in olden times, not simply to that portion of the Dart on which Totnes stands, but that it extended at least from Berry Head to the Bolt, and included within its range Prawle Point, the most southerly point of Devon, and at one time considered the most southerly point of England. As

Mr. King remarks in his article on Devonshire in his *Sketches and Studies*, "the original Totnes (the projecting ness or headland, A.S. *totten*, to project, so Tothill, Totteridge) may have been either Berry Head or Prawle. The whole coast was named from it; and the landing of Brutus is fixed by Layamon (ab. 1205) at Dertemuthe in Tottenes. The name of the entire district became at last confined to its chief town, probably of British foundation."

As to the derivation of the name "Totnes," very different are the conjectures. In the old records it is spelt in various ways; for instance, in *Exon Domesday*, Totneis; in *Exchequer Domesday*, Totenais; in other records Totnais, Tottonie, Totton, Tottoneys, &c.

One writer believes the word to be of Scandinavian origin, being from *Toft*, a Danish prefix signifying enclosure, and "ness" a headland or hill, the name meaning the village under the hill.

Another suggests that the termination *ais* or *eis* is the Anglo-Saxon *æsc* an ash, also a ship or boat, as built of ash, and *Toten* the genitive of *Tohta*, a leader or commander, thus we have *Tohtanesse*, the vessel of the leader or the commander's ship, commemorating the fact of the boat of some great invader having here come to land.

Another makes it "the stream fortified hill" or "fortress land," or "the great stream hill or fortress."

It must be left to others more competent to decide whether either of these is the correct derivation.

The British trackway known as Ickneild Street, is said to have passed through Totnes; and in British times no doubt this town occupied no low position, being on the main road to the West, and a place from which tin was exported to Brittany and other parts of the Continent.

Totnes shore afforded great facility for intercourse with Brittany, an intercourse which was sustained during the last years of Roman domination, during the advance of the English westward, and was in full operation 200 years ago.

Nothing authentic exists relative to the history of Totnes during the Roman occupation; but in different parts of the town, and especially near the river, Roman coins have at different times been found.

One of the Roman causeways passed through Totnes, going over what is now known as Harper's Hill; and up to a very recent period some portions of this road remained paved, but during the last few years almost all trace of the pavement has disappeared.

Within the recollection of some residents this road was paved right down to the Plymouth road.

Prior to the Norman Conquest the history of Totnes is very meagre, but at the Conquest we find it one of the chief towns in the county, as the following translation of the record of it in *Domesday Book* shows :

"Iudhel holds of the King the borough of Totenais, which King Edward (the Confessor) held in his demesne. There are within the borough one hundred burgesses, save five, and fifteen without the borough tilling the land. Amongst them all they pay eight pounds by rate ; formerly they paid three pounds by weight and money. This borough is only taxed when Exeter is taxed, and then they pay forty pence for tax. If there be an expedition by land or sea, Totenais, Barnstaple, and Lydford pay just as much service as Exeter pays."

Iudhel here referred to was a Norman retainer of the Conqueror, of considerable importance, and evidently in great favour with the king, who assigned to him no less than 107 manors in Devon ; and he took his name, Iudhel de Totenais, from the place at which he fixed his chief residence, or the principal town in his dominion.

He is said to have been a son of Alured the Giant, who was held in high estimation by Duke Robert of Normandy.

Iudhel is said to have been the builder of Totnes Castle, the Norman keep of which still remains, and which probably occupies the site of earlier fortifications. It stands on what appears to be an artificial mound.

The walls of the town, some portions of which can still be traced, extended from the Castle to the North Gate, which is still standing, eastward from thence to the Guildhall and Grammar School, formerly part of the priory of St. Mary, founded by Iudhel, to the East Gate, which stood in the centre of the town. It formerly consisted of two arched portals, one for carriages, which was enclosed with gates like old Temple Bar, and a smaller narrower one, "a needle's-eye," for foot passengers. In the room over this gateway is a fine coloured carved frieze, above the linen panelling and surrounding the room, with, over the chimneypiece, heads of King Henry VIII. and Anne Boleyn ; it is a beautiful specimen of the early renaissance, and probably was executed by a foreign artist.* A hundred years ago the East Gate House was an inn, known by the sign of the "Angel."

From the East Gate the walls were continued along the

* *Trans. Devon. Assoc.*, vol. ix. p. 159.

back street, still known as "behind the walls," to a point where now stands the Market House Inn—here was the South or Shambles Gate; continuing from thence to the main street the West Gate was reached; this being very low and narrow, was removed early in the present century, and from thence the walls went back to the Castle.

Henry III., by letters patent, dated 10th April, 1265, gave the burgesses and inhabitants of Totnes liberty and leave to inclose the town with a wall, and allowed the collection of a custom called "murage" towards the cost.

It seems probable that this applies to a re-building rather than a first encircling the town with walls. It may have been, however, that the town was surrounded with mounds and ramparts, and that now walls were substituted.

The earliest notice of the existence of a church in Totnes is in a charter of Iudhel, by which he grants the Church referred to in the charter as "ecclesiam Sancte Marie de Toteneo" to the great Benedictine Abbey of S.S. Sergius and Bacchus at Angers; and in this charter mention is made of a chapel of St. Peter in or near Totnes. Of this chapel no trace now remains; it stood near the river, just outside the boundary of the borough, and near what is now known as St. Peter's Quay.

On the north-east side of the church stood the priory of St. Mary, founded by Iudhel, the only remains of which are some portions of the guildhall, prisons, and sexton's houses. The priors had the right of presentation to the parish church up to the time of the dissolution of the religious houses at the Reformation, except during the French wars, when the crown appointed, this being an alien priory.

Iudhel was banished by William Rufus, and the barony of Totnes given by that monarch to Roger de Nonant or Novant. In the reign of King John, however, Henry de Novant and William de Breose or Bruce, a grandson of Iudhel, held the barony in moieties. Novant's descended to the Valletorts, and Bruce's passed by marriage to Cantelupe, who eventually became possessed of the whole. In 1238, William de Cantelupe, as Lord of Totnes, exempted the Abbot and Convent of Torre from payment of manor tolls in Totnes. The heiress of Cantelupe brought the barony to Lord Zouch, whose family held it for many generations; and one of whom, William Zouch, was mayor of Totnes in 1400.

On the attainder of John, Lord Zouch, in 1486, for siding with Richard III., King Henry VII. gave the castle and lordship of Totnes to Sir Richard Edgcumbe, of Cothele.

Sir Piers Edgcumbe, in 1559, conveyed the manor of Great Totnes to the Corporation, at a reserved rent of £21 per annum and a burgesship to his heirs for ever.

The grandson of Sir Richard Edgcumbe sold the barony to Lord Edward Seymour, of Berry Castle, son of the Duke of Somerset; John Seymour sold it, in 1655, to William Bogan, Esq., of Gatcombe. In 1726 the widow of Bogan sold it to John Taylor, who devised it to his son James; in 1753 James sold it to Bartholomew Jeffery, whose nephew and heir, George Jeffery, of London, merchant, in 1764 sold it to Edward, Duke of Somerset, from whom it has descended to the present Duke.

Lysons says the lords of this barony had formerly the power of inflicting capital punishment.

The castle and borough was valued, 10th Edward I. in £20 per annum, and the owner claimed in the manor, lien of frankpledge, assize of bread and beer, a ducking stool, and a pillory. To the castle and honour formerly belonged fifty-six knights' fees. The lords of Totnes included the port and town of Dartmouth in their domain, until Nicholas Tewkesbury bought it of Lord Zouch.

The foundation of Dartmouth was long subsequent to that of Totnes.

Prior to the Conquest the chief officer of the borough would have been the portreeve, and in after years, when there was a mayor, the office of portreeve was continued; and, from the appointments at the Mayor's law court, it appears that the owner of the East Gate House held the office, but in later years the portreeve seems to have been the crier.

After the Conquest the chief officer would be termed the bailiff or seneschal; in the entries of the Mayor's court before referred to, and in some of the other documents, the town clerk is in later times also called the seneschal.

King John, in the seventeenth year of his reign, 10th May, 1215 (some authorities say seventh year of his reign, and which is correct cannot be determined), granted to the borough its earliest known charter; the original is not among the corporation documents, but it is referred to in all the later charters. The translation of it is as follows:

"John, by the grace of God, King of England, Lord of Ireland, Duke of Normandy and Guyenne, and Earl of Anjou, to all Archbishops, Bishops, Abbots, Earls, Barons, Justices, Sheriffs, and all his Bailiffs and faithful subjects greeting!

Know ye that we have granted, and by this our present charter confirm, that our borough of Totnes be a free borough, and that our

burgesses of the said ville shall have a gild of merchants and freedom throughout our whole land from toll, pontage, pupare, stallage, livage, lastage, and from all such customs. We have granted also to them that they shall not implead but within the borough aforesaid, of the things or tenures belonging to the said villa. We will also and grant, that no sheriff or excheator, or any other our bailiff shall in any wise meddle with any thing, complaint, or occasion in any other thing belonging to the said borough, besides pleas of our crown, which, notwithstanding, shall be attached by the said burgesses until the coming of our Justices in Eyre into Devon.

In testimony whereof we have made these our letters patent. Witness ourself, at Westminster, the tenth day of May, in the seventeenth year of our reign."

There are still preserved in the council chamber of the ancient guildhall the following original charters granted to the borough :

1. Charter of Inspeximus and Confirmation granted by King Henry VIII., in the first year of his reign, of the charter granted by King John. About a third of the great seal of Henry VIII. remains annexed.

2. Charter of Inspeximus granted by King Edward VI., in the first year of his reign, of the charters of John, Henry VII. and Henry VIII. Two-thirds of the seal remain.

3. Charter of Inspeximus granted by Queen Mary, in the first year of her reign, of the several charters of John, Henry VII., Henry VIII. and Edward VI.

The seal, which is in fragments, is sewn up in a bag.

4. The Great Charter, granted by Queen Elizabeth in the thirty-eighth year of her reign.

Some fragments of the great seal remain.

5. Charter granted by Queen Elizabeth in the forty-third year of her reign.

A fragment only of the seal remains.

6. Charter of Inspeximus and Confirmation of the charters of John and Henry VIII., granted in the fifteenth year of Charles I., at the request of the mayor and burgesses.

Some fragments of the seal only remain.

7. Charter of Privileges granted by Charles II., in the thirty-sixth year of his reign, appointing Christopher, Duke of Albemarle, first chief seneschal or steward of Totnes, and John Harlowin the then next mayor.

Only a fragment of the seal remains.

The charter of Henry VII. is missing, and appears to have been taken away by one of the town clerks about 250 years since and never returned ; and the charter of James II.,

granted in April, 1688, by which he accomplished his purpose of making Sir J. Southcote a Catholic, Recorder * is also missing. The original, it is not unlikely, was returned when the former charter was restored, a few months later in the same year.

Of the other documents of the corporation the earliest is a covenant between the abbot and convent of Buckfast, 20th Henry III. (A.D. 1236), and the burgesses of Totnes, by which the abbot and monks were admitted into the Merchants' Gild. On this has been written a list of the members of the gild, dated about 1272. The earliest roll of the Gild Merchant of Totnes, of which rolls there are a very large number, bears date 1260.

There is also an exemplification under the great seal, 8th Edward III., of the finding of an assize; the seal annexed is in fair condition.

The grants of Queen Elizabeth to the Corporation of the guildhall, a portion of the old priory, and to hold land, are also preserved, together with a large quantity of old accounts, papers, letters, &c., including two printed proclamations of Oliver Cromwell, while Protector; one dated Whitehall, 26th April, 1655, is "for declaring his highnesses pleasure and command for putting in execution the laws and statutes and ordinances made against jesuits and priests, and for the speedy conviction of popish recusants."

The other is dated Whitehall, 12th July, 1655, and it declares, that after 1st of August of that year, no further use should be made of any letters of marque or reprisal granted to any private person.

The arms of the borough in use now are exactly similar in design to those in use three or four hundred years ago; they are simply a three-turreted castle, with a key on each side; there is no motto.

It is believed that old Totnes Bridge, which connected the town with the manor of Bridgetown Pomeroy (now a part of the municipal borough), was erected in King John's reign. It was a bridge of eight arches, three hundred and sixty feet long, and so narrow and inconvenient that it was taken down and the present one erected in 1828; some part of the old bridge is said to have been widened in 1692.

In demolishing the old bridge, on one of the foundation stones the workmen professed to find inscribed the date, 1111, but the fact of there being four straight lines on one of the stones can hardly be deemed satisfactory evidence of date.

* Dismissal of Sir E. Seymour, *Trans. Devon. Assoc.*, vol. viii. p. 360.

The old bridge was very similar in character to the present Staverton bridge, the next on the Dart above it.

At the end of the old bridge stood the chantry founded by William de Cantilupe, and dedicated to St. Edmund King and Martyr, and St. Edward the Confessor; it was suppressed by Henry VIII.; in the west end of the chapel hung two bells.

Originally the river was crossed by a ford from the slip called the Riding Place Quay, to a similar slip on the Bridge-town side.

In 1259 the conventual church, which appears to have been the same as the parish church, was consecrated by Bishop Bronescombe; this must have been a church re-built on the site of the one existing in the time of Iudhel de Totnes.

In 1295 Totnes first returned a member to parliament. Johannes de Blakedon being the member then returned; in 1298 two members were returned, and the borough continued to elect two until 17th Edward IV.

The first record of the election of a mayor is that of John Russel, in 1377, and from that date to the present time, a period of over five hundred years, the list of mayors of Totnes is complete and uninterrupted.

Henry IV., in 1399, relinquished possession of the Priory of Totnes, upon condition that aliens should not be members of it.

The parish church of Totnes was again re-built in 1432, Bishop Lacy granting an indulgence of forty days to all who contributed to the work.

In 1542 the Priory was dissolved, and the site granted to Katherine Champernowne and others.

In addition to the Priory, the chapel of St. Peter, and the chantry at the bridge, there was, also, the chapel of the Holy Ghost and St. Katherine, which was situate in a part of the town still known as Warland; it was erected in 1270, by Walter le Bon and Agatha his wife, and must have been of considerable importance, and the lands connected with it of large extent; in 1508 it was appropriated to the Priest Vicars of Exeter Cathedral, and shortly after ceased to be used as a religious house, and the lands were let; they were sold in 1801 under the Land Tax Redemption Act, and now only very slight traces of a portion of the walls remain.

The house of the lepers of St. Mary Magdalene, which stood in the higher part of the borough, near Leechwell, was erected at a very early period; its site is now occupied by two ruined

cottages, but a part of an arch of the old building, which included a chapel, can still be traced.

During the reign of Edward VI. a portion of the site of the Priory was granted for a school for boys, and thus originated the present Endowed Grammar School, still held in the original building adjoining the guildhall; underneath this building is a large cellar or crypt, the north wall of which is the original town wall, with the loopholes still remaining.

In 1547, the first year of Edward VI., the right to send members to parliament was restored.

In 1572 Queen Elizabeth made a grant under her great seal annexing the guildhall to the borough; it had formed a portion of the priory, and from 1553 was used as a guildhall, and has been so used ever since. In the large hall, over the mayor's chair, are the royal arms, with the date 1553, and in it and the council chamber are good specimens of linen pattern carving; in the latter room over the fire place is the date 1624.

In the hall and council chamber are the arms of the Bedford family, which, no doubt, find a place there from the fact that Francis, fourth Earl of Bedford, was, in 1630, High Steward of the borough.

In 1588 Totnes took its part against the Spanish Armada. Sir Edmund Lye, a Totnes man, and one of the bold sailors who in their privateers were the terror of the Spaniards, fitted out two vessels at his own expense and went to Cadiz. One of his vessels was lost on its return, and he then fitted out another and joined Howard and Drake, and assisted to destroy the Invincible Armada. In addition to this the town and neighbourhood paid large sums towards the fitting out of the *Crescent* and the *Hart*, two vessels sent out from Dartmouth to assist Drake.

In July, 1590, the plague broke out in Totnes. It was brought from Dartmouth, and in a little more than twelve months two hundred and fifty-eight persons died of the disorder.

Queen Elizabeth, in 1596, granted a charter to the borough, which has been before referred to; it was, perhaps, the most important ever received, and up to 1835 the governing charter of the borough; under it the Corporation consisted of fourteen masters and councillors, one of whom was annually, on the twenty-first September, elected mayor. There was also a recorder and town clerk, and twenty freemen, commonly called "twenty men," who superintended the letting of the lands vested in the Corporation.

A medicinal spring, says Lysons, was discovered at Totnes

in 1605, which was said to cure all sorts of diseases. Such was its popularity for a few years that the resort to it is said to have been incredible, and such quantities of water were sent away in bottles that there was not sufficient to supply the demands; but its virtues having been found over-rated the character of the spring declined, and when Westcote wrote his *Survey*, about thirty years afterwards, it had grown into disuse. Where this wonderful spring was situated is not known; there were, however, in and around Totnes several springs and wells, for which wardens were appointed at the law courts. Among these was Leechwell, which is still in existence and much thought of; it is in a lane leading from near the Shambles or South Gate towards the Maudlyn or Leper House. The water flows into three large stone troughs, and each stream was believed to possess peculiar medicinal qualities. At the present time the water of these springs is considered specially good for persons afflicted with weak eyes, and many so afflicted still go to the stream to bathe their eyes.

As far back as 1450 there appears an entry in the borough muniments of the appointment at the law court of wardens of this well, and the nearest street is still known as Leechwell Street. At the same time wardens were appointed of the well called "Sergyswelle" and "Colasywille," and there are references to "Harpyswell" and "Brasiters-well." Of the two former nothing is now known; Harpyswell is a stream now conveyed into a cistern, situate in the old Roman road known as Harpershill Street. This stream is a very good one, and is still used to assist in supplying the town. Brasiter's well also exists; it has been of late years supplied with a pump, and is known as the town pump. It is about half way between the East Gate and the bridge, and is just off the Fore Street.

Slatswell, the well near the pillory, and St. Nicholas well, are also mentioned, but no trace of them now remains.

From time immemorial a supply of water has come from the Broomborough estate, about a mile out of Totnes, but within the parish. This stream is said originally to have flowed in an open gutter; it was, in 1697-8, diverted to pipes made out of trunks of trees hollowed. About fifteen years ago, when the mains were relaid, remains of these novel pipes were found. The next pipes were earthenware, small at one end and larger at the other, and fitting into one another; these were superseded by lead pipes, and on two large reservoirs being built, some years since, the latter were replaced by iron pipes.

Charles I. passed through Totnes in 1625 on his way to Plymouth, and had a very hearty reception. £200 was presented the king in "a faire purse," and the town accounts contain entries of the expenses in connection therewith. His majesty had with him a large retinue, and all the gentlemen of note in the neighbourhood were present, including Sir Edward Seymour, Bart., of Berry Castle, and Sir Edward Giles, Kt., of Bowdon, one of the M.P's for Totnes. The mayor's accounts show that he paid £33 3s. 4d. in fees to his majesty's officers; £1 was given to an orator, Mr. Tampion, who made an oration to the king, and the "faire purse" which contained the present cost £1 10s. On both this and the return journey the mayor rode on horseback through the town before the king.

Charles, on 7th February, 1626, created George Carew Baron Carew of Clopton, Earl of Totnes; it was he who at Oxford inspired Camden with a taste for antiquities. He was Lord President of Munster, and quelled the Irish rebellion, when Queen Elizabeth acknowledged his services by a letter in her own handwriting, beginning,—“My faithful George,—If ever services of worth were performed in shorter space than you have done we are deceived among many eye-witnesses, &c.” He died at the Savoy, London, 27th March, 1629 (when his honours became extinct), and was buried in Stratford-on-Avon church, where is a noble monument to his memory.

Among the corporation documents is a very curious and interesting one containing a list of the “armes sett 1626” on the town of Totnes, 16th August of that year; then follows a list of the persons and the arms, and in the list several ladies' names appear; the total number of arms were:

Corslettes	.	.	.	33
Muskets	.	.	.	97
Calyvers	.	.	.	13
Halberds	.	.	.	95—238 in all.

About 1630 the trained town soldiers were sixty, forty musketeers and twenty corselets. Among the town papers is also “a booke of the town sogeres made when Mr. Philip Laye was mayor, in the year 1635.” In two columns twenty soldiers armed with pikes are entered, in four others those armed with “shotte,” thirty-nine in number; notes are added stating with whose arms they are armed.

At the election of members to the Long Parliament in 1640 Totnes returned two men of considerable note, viz.: Oliver

St. John, H.M. Solicitor, and John Maynard. The former was a lawyer of known parts and industry, but taken no notice of till he argued at the Exchequer Chamber the case of ship money on behalf of John Hampden.

Maynard was the celebrated Serjeant Maynard. He was born at Tavistock in 1602, and educated at Exeter College, Oxford. In 1640 he was elected M.P. for Totnes and Newport (Cornwall, but elected to sit for Totnes. He was engaged in impeaching Laud and Strafford, sat in the Assembly of Divines, was sent to the Tower in 1647 and 1653 for opposing parliamentary measures, and pleaded strongly for the life of Charles I. He was made a King's Serjeant and Knight in 1660. He opposed the policy of James II., and when asked to be counsel for the prosecution on the trial of the seven bishops declared he could not in conscience do what was asked of him. He actively promoted the Revolution of 1688, and though eighty-seven years of age was one of the commissioners of the great seal in 1689, and M.P. for Plymouth, dying on 9th October of the same year. In 1688 he was recorder of Totnes. Some relatives of his were men of standing in the town, a Christopher Maynard on four occasions filling the civic chair, who bequeathed sums of money to the charities of the borough. Serjeant Maynard, as a trustee of money left for education by Elizeus Hele in 1652, conveyed an estate in the parish of Harberton as an endowment of the Totnes Grammar School, to which it belonged up to a very recent date.

The trade of the merchants of Totnes with the south of France in cloth, leather, yarn, and shoes, was very extensive, and Totnes must have been one of the principal seats of the clothing trade.

In the twelfth and thirteenth centuries Totnes was largely interested in this trade. "Hose of fine Totnes" appears in sundry romances and in the Welsh "Mabinogen," where the dress of an important personage is described as especially splendid. There was a kind of coarse cloth made only in Totnes and its neighbourhood, called "narrow-pin-whites," and in the Lives of the Lindsays mention is made of a chantry in Scotland for giving a certain quantity of Totnes cloth.

In the seventeenth century the merchants of Exeter, Dartmouth and Totnes suffered much from Turkish marauders. In an old book belonging to the corporation of Dartmouth occurs an entry of a certificate of the mayor, bailiff, and burgesses of Dartmouth, under their common seal, dated 5th July, 1615, that Thomas Newman, of Dartmouth, had had a

ship of hundred and twenty tons captured by the Turkish pirates as she was returning from Marseilles; and the certificate mentions that the Turkish pirates of Tunis and Algiers, which frequented the coasts of Spain and Portugal, had captured ten ships of the town and port of Dartmouth; the value of the ships and goods on examination they found to be £8000, besides which many of the seamen had been made captives. A list of the ships and their value was appended.

In a petition addressed to the Earl of Bedford, Lord Lieutenant of Devon between 1625 and 1630, asking that the trained soldiers of Totnes, instead of being sent to the general muster might be trained within their own precincts, is the following reference to the town and its trade :

"It (Totnes) standeth upon the river Dart, seven miles from the town of Dartmouth, and from thence a daily passage by water, within four miles of Torbay, being a spacious bay able to receive five hundred ships or more, and fine and easy landing, being not over fourteen hours sail from the coast of Normandy and Brittany, and well known to the French and others by reason of continued trade thither."

In the British Museum is a memorial to the Privy Council, respecting the goods of certain Totnes merchants which had been stopped at Lyons.

That the merchants of Totnes were much interested in the doings of the Turkish pirates appears from a letter dated 12th September, 1636, from John Lewkenor, of Dartmouth, to Thomas Martyn, mayor of Totnes. It begins :

"Worshipful,—I have been entreated by Mr. Governor and the rest of the merchants of Exon, to make known unto yourself and the merchants of the towne how far I have waded in the prosecution of the suit unto the King and the Lords, for some course to be taken to suppress the Turks and secure the trades. I have, therefore, sent you herewith enclosed the copies of all the petitions which have been preferred Unto this my Lord Archbishop (Laud) hee gave this answer, striking his hands upon his breast, that while he hath breth in his bodie he would, to the uttermost of his power, advance a business so necessarie and consequentiaall, and has assured me that his Majestie would take such course as that within this twelve months not a Turkish ship should be able to putt to sea; and at the Board his Grace was exceeding heartie in the business."

No doubt the war between Charles and the Parliament was at first the cause of the decline of the woollen trade in Totnes, but whatever might have been the ultimate cause it gradually

fell off until the commencement of the present century, when it quite died out, and has never since been revived.

By the side of the guildhall was formerly a market for yarn, leather and shoes, held under piazzas known as the "new house."

In the struggles between King Charles and the Parliament the West played no inconsiderable part; and though in Totnes no fighting actually took place, it was occupied first by the Royalists under Lord Goring and afterwards by the Parliamentarians under Sir Thomas Fairfax. Like the neighbouring borough of Plymouth, Totnes was strongly parliamentary.

From Devon a remonstrance against ship-money was sent up to the court as early as 1634, signed by many Devonshire gentlemen, and one of those who objected to the payment was Sir Edward Giles, Kt., of Bowdon House, Totnes, and Dean Prior, one of Prince's "worthies." He was for some time M.P. for Totnes, and a leading man in the borough.

This petition or remonstrance was, says Mark Garrard, the correspondent of Strafford, "ill taken, and five of them sent for up, who are come all except Giles, who is weak and not able to appear. They have received some reprimand, and so I believe will be dismissed back again, it being punishment enough to them to have travelled four hundred miles to so small a purpose."

Giles's excuse was probably no idle one, for he died at Dean Prior in December, 1637.

In 1635 the Totnes Receiver's accounts have the following entry :

"Paid Samuel Putt for his charges to ride to Exon with shipping money, 9s."

The warrant for this levy of ship-money is still among the corporation documents, also another dated 1637-8. Totnes may be proud to think that in the struggle against the illegal tax its leading men sided with John Hampden, and in 1640 returned to parliament Oliver St. John, Hampden's counsel.

In 1638, in the mayoralty of Henry James, the shipping money collection was—in the higher quarter of the town £13 10s., in the middle quarter £45 19s. 9d., in the lower quarter £47 9s., being a total of £106 18s. 9d.

The "denialls" are given at the end of the account, and amount to £6 15s., and among those who refused was John Savery, one of a family of note in Devon, many members of which were, as merchants, connected with Totnes, and on several occasions filled the civic chair. In 1639 the then

mayor was in trouble owing to the shipping money, and in the Calendar of State Papers is a letter from him and the ex-mayor, Henry James, to the council, in which they say :

"Since your letter of the 10th July, we, the Mayor and late Mayor of Totnes, have endeavoured the levying of £4 18s., required by the said letter, but cannot effect the same by reason of the persons on whom the money is levied having either left the town, died, or having nothing here distrainable, wherein we pray your directions. And I the present Mayor do certify that I have used my utmost endeavours to levy the proportion of £44, assessed on this town for last year, but all such as are mentioned in the enclosed note refuse to pay their several assessments, and have, for the most part, nothing distrainable ; Wherefore as to that I also beseech your direction, they being most of them men of the better rank of quality, too powerful for me to contend with, and as you direct I will to my utmost observe."

Then follows a list of persons refusing to pay, occupying two and a quarter pages.

In October, 1645, Lord Goring occupied Totnes with some of the loyal cavalry ; Sir Thomas Fairfax, who commanded the Parliament forces, was at Ottery, and owing to sickness among his soldiers removed to Tiverton, where he remained for some time ; in the following January he reached Totnes, coming through Ashburton. He arrived on the 10th of that month in Totnes, the King's forces quitting on his approach. Fairfax remained in Totnes preparing for the siege of Dartmouth, which surrendered to his forces after a few hours' attack, on 21st January, 1646-7. He then returned to Totnes, and whilst staying there he called together the friends of the Parliament in the county by proclamation. About 3000 are said to have attended, out of whom he formed a regiment, which he placed under the command of Col. Fowell.

The accounts of Mr. Philip Ley, the mayor for 1646-7, contain full particulars of the trouble and expense to which the town was put by its visitors ; he speaks of it, and well he might, as the "unhappy and second time of my maioralty."

The cost to the town was enormous, and the Royalists appear to have been the most expensive.

£150 was agreed to be given Lord Goring "for the preservation and more safety" of the town ; of this sum £115 12s. was actually paid ; Prince Charles, who was in the West, received £100 ls., and his officers demanded £10 more. A further sum of £7, part of a larger sum of £10, was paid to keep Lord Goring's horse out of the town, the inhabitants not caring for too close an acquaintance with the gay Cavaliers ;

£42 13s. 4d. was also demanded by the King's friends in Exeter.

Sir Thomas Fairfax does not appear to have been at all so costly a visitor, and his troops appear not to have rendered it necessary they should be paid to keep out of the town. The largest item to put to the Parliament's account is £172 18s. 3d., for kerseys, shoes, and stockings, supplied to his army, the shoes being six hundred and fifty-three pairs at 3s. 6d. a pair.

No sooner had the Cavaliers and Roundheads left the town than a worse visitor than either, the plague, appeared. On July 30th, 1646, occurs the first entry of the burial of a person dying from this disorder, and from that date to October 4th, 1647, there were two hundred and seventy-six burials.

It is said that on this occasion the town was almost deserted. No doubt the remembrance of the visitation fifty-six years before caused those inhabitants who could to fly. The grass grew in the streets; but Bridgetown was not attacked, and a barrier was placed across the bridge to prevent the infection being carried out of the town, the necessary supplies for the inhabitants being placed on the bridge, and the money paid for them put into a bowl of vinegar.

During the Commonwealth there appear to have been no events of any great moment in the history of the old borough, but in December, 1659, there was a disturbance relative to the demand of a free parliament, when two of the inhabitants lost their lives. One of these appears to have been a freeman of the borough, the entry of whose burial appears in the registers, under date 29th December, 1659:

"Toby Amyatt shot by soldiers."

In May, 1660, an address of laudation and congratulation to King Charles II. on his restoration was sent up from Totnes, in which it was stated that the late demand from their county for a free parliament proves its loyalty, and that two of their inhabitants lost their lives in the dispute; they send His Majesty a small freewill offering, such as they gave in 1645 when he left them; hope his presence will revive the trade, which a peace with Spain would greatly conduce, but they leave to him the settlement of Church and State. This was signed by Thomas Brookinge, mayor, and thirty-nine others. The present referred to as previously given was the £100 given Charles when he was at Totnes in 1645, during the Civil War.

The town accounts show that great was the rejoicing at the Restoration; in February, 1660, the bells rang on the secluded

members sitting in parliament, and on the 11th May they rang again on the proclamation of Charles II., and there was a large outlay in wine, trumpets, ribbons, &c.; but the chief rejoicings were reserved for the 29th May. To the parliament summoned to meet at Westminster, 25th April, 1660, Totnes returned Thomas Chafe and Thomas Clifford, the latter afterwards first Lord Clifford of Ugbrooke, and the "C" of the Cabal.

During the Commonwealth the marriages took place in the church, before the mayor or one of the magistrates; in 1658 they were, however, solemnized by the vicar or his curate. The mayors of Totnes appear during this period to have officiated at weddings in many neighbouring towns.

In 1662 the Rev. Francis Whiddon, M.A., who had been lecturer in the parish church, Totnes, and assistant to the vicar, the Rev. John Garrett, was on Mr. Garrett's death, in June of that year, ejected from his post by some of the magistrates. He was a man of good family, being one of the Whiddons of Whiddon Park, Chagford, and a descendant of Judge Whiddon, who has a place among Prince's "Worthies." Mr. Whiddon was the founder of Nonconformity in Totnes, and, notwithstanding some persons of position had changed with the times and persecuted him and his followers, he was highly respected by Churchmen and Nonconformists. On his death in 1679, a funeral sermon was preached in the parish church by a neighbouring clergyman, before the mayor, aldermen and magistrates of Totnes, and many clergy and ministers.

He was proceeded against on several occasions, and committed for trial at the assizes, but always got off successfully, and cost the corporation not a little in law charges.

John Prince, the learned author of the *Worthies of Devon*, was vicar of Totnes from 1675 to 1681, when he was presented by Sir E. Seymour with the adjoining living of Berry Pomeroy.

Charles, in 1675, created Charles Fitz Charles, his natural son, Baron Dartmouth, Viscount Totnes, and Earl of Plymouth. He died in 1680, without issue, when his titles became extinct.

In 1684 Charles II. granted a charter to the borough, under which a wool market was established. This market died out on the decline of the woollen trade.

In 1685 occurred Monmouth's Rebellion, and it would seem that some Totnes men favoured the Duke. In the Corporation book is an entry: "That James Cole of Totnes, Shoemaker, was bound over for conveying away James Cole, his son, who was in the rebellion with Monmouth." In the autumn of the same year quarters and heads of some of the

rebels who were executed by order of Judge Jefferies were exhibited in Totnes, as a warning to others likely to offend.

Sir Edward Seymour was during James II.'s reign recorder of Totnes, but being disliked by the king, he was in December, 1687, by order in Council removed from his office, and the Corporation were called upon to elect in his place Sir John Southcote, a Catholic, without administering to him the usual oaths. This they refused to do, and accordingly early in 1688 the principal members were removed from their office, and by a new charter their places supplied by others, and Sir John Southcote named as Recorder. In the autumn of the same year the old charter was restored.*

On January 16th, 1688-9, Totnes returned to the Convention, Sir John Fowell, Bart., and Rawlyn Mallock, Esq.—Sir Edward Seymour, the former member, sitting for Exeter, but in 1695 he sat for Totnes again.

Quieter times reigned now, and the Corporation records are of less interest, containing only strictly local matters, with occasional references to historic events by entries of payments to the ringers who rang the bells on the news coming of some of Marlborough's great victories, or entries of the charges for banquets given to some great man passing through the borough.

In 1725 the loyalty of Totnes showed itself very strongly; it was then proposed in Parliament to levy a land tax of 4s. in the £, to enable the government to carry on one of the continental wars occasioned by an alliance of the Emperor of Germany and the King of Spain; and the mayor and burgesses of Totnes petitioned in favour of the tax, and expressed their willingness to contribute the other 16s. rather than submit to a foreign yoke.

The address was published in 1727, together with a versified copy, concluding as follows:

“God prosper well our noble king,
Our lives and fortunes all!
May peace and truth and wit and wealth
The Britons brave befall.

Late, very late, may our good liege
A heavenly crown obtain!
And eke his royal house ne'er want
A prince so fit to reign!

O may our happiness so rare
To future times go down!
Let all the people say, Amen!
Amen, says Totnes town!”

* *Trans. Devon. Assoc.*, vol. viii., 1876, p. 360.

We have here a brief sketch of the history of this ancient town, and, though brief, enough to show that it has had a history in the past, the consideration and study of which may help us in the study of the history of our land; for, as has well been said, "The plan of reading *general* history by the light of *local* is one that may be applied far more widely than has hitherto been attempted, and successfully applied."

With such a history may we not say of Totnes—

"'Tis a notable old town" ?

It is not difficult to picture the appearance the old town presented to a casual visitor two hundred years ago. If he came from Plymouth he would enter the town down Harper's Hill, the old Roman road, then paved right into the town, and he would enter within the walls through the narrow West Gate. The castle ruins were much the same as now, and the main street was paved with pebbles, and had a gutter in its centre. Should such a stranger have arrived on one of the fair days he would have seen the white glove suspended on a pole, to indicate that during the fair there was open-handed dealing and free trade, and that the trade was not, as at other times, confined to the members of the Gild Merchant. The custom of putting out the glove at fair times is still observed. At fair times and on market days the "rows" or piazzas were crowded with the vendors of various commodities; "rows" underneath which "hose of fine Totnes," "narrow-pin-whites," &c., were sold.

The "rows" then were more extensive than at present, running down in front of the present market; and through the old market the South or Shambles Gate was reached. Just at the top of Castle Street stood the old open Fish Market, removed on the erection of the new market thirty years ago.

A visitor to the church two hundred years ago would have found it had not suffered, as it afterwards did, by the erection of huge and unsightly galleries, which have during the last few years been removed, and the church restored to something of its original elegance and beauty.

The East Gate was then in its ancient form, with its needle's eye for foot-passengers; and the North Gate was much as now, except that it and its fellow gateways were provided with doors or gates.

The principal merchants and inhabitants resided in the town, in some of the grand old houses still existing, the

ceilings of the rooms of which were, and still are, handsomely moulded, and the walls of which were pannelled with carved oak.

The road from Dartmouth was probably in very early times down what is known as "Fish Chouter's Lane"—a real old-fashioned Devonshire lane, down or up which only pack horses could pass; whilst for Exeter the narrow old bridge had to be crossed and Bell Hill climbed, the old road going by Bourton.

Great have been the improvements in Totnes; but we are glad that much of what was interesting, and takes us back to past times, and brings up before us past history and associations, still remains. Few know how great a debt of gratitude we owe the old burghers of our corporate towns, who in past days struggled, fought, and suffered to obtain for us many of the rights and privileges we enjoy to-day; and the inhabitants of this ancient borough have no cause to be ashamed of the part played by the burghers of Totnes two or three hundred years ago.

Nor is the roll of Totnes worthies who made their mark in Science, Literature, and Art a mean one—a roll which, we trust, will be largely added to in the future.

For the old town, and those who dwell in it, we would re-echo the wish of the old Corporation toast, repeated by each guest as he drinks at the banquets out of "ye antient loving cup," "Unanimity and prosperity to the town and borough of Totnes, and success to the trade thereof."

THE GILD MERCHANT OF TOTNES.

BY P. F. S. AMERY.

(Read at Totnes, July, 1880.)

At the Sidmouth meeting in 1873, attention was directed by Mr. Brooking Rowe,* to the great value as a source of information, bearing on the history of our county, afforded by the record of gilds, hinting that brief or apparently unimportant notes if recorded, might some day form material for a complete history of those important pre-reformation institutions. At the same time he gave a short notice of a few facts respecting the gilds at Plymouth and Totnes.

A careful perusal of the numerous records of the Gild Merchant at Totnes, compared with Mr. Toulmin Smith's *Ordinances of English Gilds*, and the exhaustive essay by Lujo Brentano on the *History and Development of Gilds*, published by the English Text Society, † convinces me that a true idea of the origin and development of town corporations can only be obtained by the study of such gilds. A few remarks, therefore, on this particular gild, and its relation to the corporation of the ancient town in which this Association now meets, may be interesting and suggestive.

Among the early Saxons whilst yet in Germany the family was, according to Waitz (vol. i. pp. 49-75), a community of all-comprehending importance, and its care provided completely for nearly all the wants of the individual. This it was able to do in consequence of the then simplicity of life. The minor found in it his protection; the insulted the natural friends who sympathized most keenly with him in every injury inflicted, and who helped him to procure satisfaction. He who would engage in those pursuits, which alone in that age were worthy of a freeman, and which at the same time promised riches and fame—in chase, feuds, and war,—found in the family

* *Trans. Devon Assoc.* vol. vi. p. 101.

† *English Gilds*, 1870.

his natural allies. Naturally, he who fell into poverty or sickness, or any other kind of distress, obtained from the family the necessary help. The family meets us here,* as the closest possible union, consisting of real brethren, so thoroughly animated with the spirit of brotherhood and of mutual assistance and support, that it brought all conceivable relationships within its reach, and provided completely for nearly all those wants, the satisfying of which fell in later days partly to the State, and partly to the artificial societies which were formed for this very purpose. The natural bond of the feeling, however, became more and more relaxed with the increase of the number of relatives; and the constantly increasing number of kinless people and of strangers would further the formation of a new institution to take its place. This change was necessary in the Anglo-Saxon settlements in Britain, where emigration had broken up the true family circles, and called into existence the artificial of *frith-borh* or *frank-pledge*, which was the mutual security that freemen of the same places (*communitas*) gave for each other's good conduct, and was the germ which in after years developed into gilds merchant, and through them into municipal corporations. Dr. Brentano declares most emphatically that he considers England the birthplace of gilds,† although their similarity to the early family bond leads many authorities wrongly to treat them as of German origin.

The "view of frank-pledge" which is now kept up in the courts leet is the one relic that remains of that ancient law, which required every freeman in every "*communitas*" to be actually enrolled in the *frith-borh* on arriving at a certain age, and thenceforth to be present at every one of its regular meetings. King Alfred recognized the common responsibility of the members of the frank-pledge; and Athelstan accepted the united *frith-gilds* as the constituent element of borough life in London.

The time, however, soon arrived when the *frith-borh* as "an old bottle" was unsuited to contain the "new fermenting wine" of developing English towns. Miss L. Toulmin Smith‡ in her introduction to her father's work, says that gilds were the outcome, in another form, of the same spirit of independence and mutual help which also made our old English fathers join together in the '*frith-borh*' or '*frank-pledge*,' the institution which lies at the very root and foundation of modern civil society. The difference between the gild and

* *English Gilds*, pp. lxix. lxx. lxxiv.

† *Ibid*, note 1, p. lvii.

‡ *Ibid*, p. xv.

'frith-borh' was akin to that which lies between the old words 'wed' and 'borh;' as 'wed' is that security which is given by a man personally for himself as an individual, and 'borh' the pledge given by a man for others, so a gild was the association together of men for common objects of private and individual benefit, in which each gave his 'wed' to abide by the internal bye-laws; while a 'frith-borh' was the banding together of men within the limits of a boundary, in which each joined in the 'borh' or pledge for keeping the peace and performance of public duties by all the others.

Directly persons living in the same neighbourhood realized they had as neighbours common obligations, whether social or religious, they formed themselves into an association or gild. She further says: * "Whatever was the particular form and object of ancient gilds—and my father considered that there—in some of them differed widely from those of later times—the principles which gave them life were the same, namely, those of mutual help and manly independence, which could think of the rights of others. These were true *corporations*, though as different places increased and grew unequally, different shapes were taken, some larger and some smaller, and some dwindled away to nothing. Representative councils, &c., are a mere incident, and not essential to corporations. The whole body used to be *the corporation*. It follows from this principle of free association that as no wrong was done to any one, and no public responsibility of individuals interfered with, the king's license was *not* necessary to the foundation of a gild.† It was the acknowledging the rights of a gild already existing that formed the charter confirming those rights. Gilds were lay bodies and existed for lay purposes, *to enable those who belonged to them, rightly and understandingly the better to fulfil their neighbourly duties as free men in a free state.*" Dr. Brentano traces how the ancient gilds merchant frequently expanded into the governing body of the corporation.‡ He tells us when several gilds existed side by side, the oldest maintained a very natural precedence over the others.

Gradually some system of hereditary transmission of the gild came into existence *de facto*, in that the son generally entered the fraternity to which his father belonged, the sons of gild brethren were naturally more willingly accepted than

* *English Gilds*, pp. xix. xxi.

† Compare Mr. Cotton's remarks on Exeter Gilds and royal license. *Trans. Devon Assoc.* vol. v. p. 117.

‡ *English Gilds*, p. xcvi.

other new members, and the conditions of entry rendered more easy to them. Thus originated a certain circle of families which from generation to generation belonged to the highest gild, and continuously constituted its stock. As the oldest gilds had grown out of the old Anglo-Saxon frankpledge, whose members as freemen were land-owners, the possession of an alienable estate (*soca*) continued a qualification of entry, and gave those members influence, rendering that gild really the governing body of the town. It therefore became necessary for persons wishing to enjoy the full benefit of burgesses to enter the gild, means for which was provided, as we shall see, and people at a distance frequently sought to unite themselves with the burgesses of a thriving town.

The Gild Merchant of Totnes is a good illustration of this development; of its origin no record seems to exist, but among the corporation documents, which are preserved with praise-worthy care, are a number of rolls relating to the gild.

The Charter of Inspeximus and Confirmation, granted by Henry VIII., recapitulates and confirms an older charter of King John, which is as follows :

"JOHN, by the grace of God, &c. ! KNOW YE that we have granted, and by this our present charter confirm, that our Borough of Totnes be a free borough, and that our burgesses of the said vill shall have a Gild Merchants, and freedom throughout our whole land from toll, pontage, pupare, stallage, livage, lastage, and from such like customs. WE have granted also to them that they shall not implead but within the borough aforesaid, of the things or tenures belonging to the said vill. WE will also and grant that no sheriff or excheator, or any other our bailiff shall in any wise meddle with anything, complaint or occasion, or any other thing belonging to the said borough, besides pleas of our crown, which notwithstanding shall be attached by the said burgesses until the coming of our justices in Eyre into Devon. In TESTIMONY whereof we have made these our Letters patent. WITNESS ourself at Westminster, tenth day of May, in seventeenth of our reign." (A.D. 1215).

From the time of this charter the Gild Merchant was the recognized municipal authority, whose ordinances were binding on inhabitants outside the gild, and the provost, portreeve, seneschal, warden, or by whatever title the head of that body was designated, became the acknowledged chief officer of the borough. Then persons of influence without the borough sought to enter the gild, and partake of its honours and privileges.

On the back of one old roll of brethren and sisters' names we find, very faintly written, a covenant between the Abbot and Convent of Buckfast and the burgesses of Totnes, of which this is a translation: "This is an agreement between the Abbot and Convent of Buckfast and the Burgesses of Totton in the 20 year of the Reign of King Henry [III., A.D. 1236], to wit that the said Burgesses have received the said Abbot and Monks into the Merchants' Gild, to wit that they may be able to make all their purchases in the same manner as the Burgesses, all sales however being exempted by way of trading. Paying yearly to the Merchants' Gild 22^d on the Saturday next before the Nativity of our Lord for all *tallages* [tolls] which belong to the commonalty."

From the care taken in the wording of this agreement we see how jealous the burgesses were lest merchants from without should compete with themselves in their own market; so the abbot and monks were only permitted to buy, and not to sell.

As a set off for admitting the Buckfast Convent, we find that, in 1238, William de Cantelupe, who held the Barony of Totnes, by virtue of his being Lord of the Manor, exempted the Abbot and Convent of Torre from payment of tolls in Totnes. At the same time the Abbot seems, from a subsequent entry, to have paid an annual sum of 2^s for this honour, and we find recorded among the business of the "Common Court of Tottoneys, holden on the Tuesday next after the Feast of St. Luke, in the 7th year of the reign of King Edward, son of King Edward [A.D. 1313], it was adjudged by the whole Court, that the men of the Abbot of Torre should be distrained, because that the said Abbot had not made satisfaction for arrears." As the gild became more important, and the outsiders admitted more numerous, greater system seems to have been used in recording the business of the Corporation. The oldest gild document is a roll in Latin, consisting of four membranes sewed together, measuring 62 inches by 8½ inches. It bears the following heading:

"Rotul' Gylde m^ocatoz Totton' Tempore Ric^odi filii ade t Ric^odi de Porta . ann^o dñi m^o c^oc^o . sexagesimo.

"Hec sc^opta sunt p manus Bartholmei cap^hi t c^hici frnitatis qui est hui^o Libtatis Jurat^o cui^o sunt sbseqñtes."

From which it seems that Bartholomew the chaplain and clerk was a sworn official of the gild. We elsewhere learn that he became vicar of Totnes in 1269, and to the passing of the Municipal Corporation Act the Mayor and Corporation, who represented the gild, paid the vicar his stipend and

had control of the church. Then follows a long list of 316 members of the fraternity, written in two columns, preceded by the following notables :

The Abbot of Torre.
 The Abbot of Buckfast.
 Walter le Bon (Founder of Warland Chapel).
 Richard son of Ade } Wardens of the Gild.
 Richard de Porta }

The following names are selected to illustrate the class of people who formed the gild :

I. Those residing at a distance—

Robert de Dartmouth.
 Jordan de la Stock (Stoke ?).
 Galfrid de la Wodelonde (Woodland).
 Walter de Wuwelburth (Wolborough ?).
 Thomas de Powderham.
 Richard de Plimpton.
 Gilbert de Exonia.
 Richard de Buffestra (Buckfast).
 Roger de Bovey.
 Radulf de Mobberya (Modbury).

II. Residents in the neighbourhood—

William de Garston.
 William de Folaton.
 Thomas de Sparkewill.
 Sonata de Luxcumbe (Luscombe).
 William son of Richard de Cornworthy.
 Robert de Hurburneford.
 Hugo de Wasseburne.

III. Burgesses of Totnes—

Hugo Pystor.
 Roger Elyot.
 Richard Russel, Junior.
 Benedict de Fonte.
 Walter Edeward.
 John le Lorimer.
 Richard le Mestra.
 Richard Paris.
 Thomas Draper.
 William London.
 William Gamelyn.
 Walter son of Galfrid Rusticus.
 Peter Coffyn.

IV. Sisters of the gild—

Matilda daughter of William Hamelin.
 Annas daughter of Savery.
 Leticia daughter of William de Ponta.
 Agatha Bona (wife of Walter de Bon).
 Ysota daughter of Michael de Baddaston.
 Margreta daughter of Oggis faber.

Against a large proportion of the names in this and following rolls is placed a cross; others are struck out, and are most probably of persons whose deaths were officially reported, as in the case of John de la Yollalonde, who it is stated was hanged. The names not so marked or erased I imagine represent persons who had been admitted on other qualification than being resident freemen, and whose deaths it was no one's interest to report, remaining on the list for ever, as the law presumes no one to be dead until proved to be so.

After the first couple of hundred names more particulars are given, which form is continued in later rolls, and in most cases the mode of admission. From these we find that entry into the gild was obtained by INHERITANCE, NOMINATION BY THE FRATERNITY, GIFT, and by PURCHASE. The following will serve as examples of each class:

By INHERITANCE. "ALICIA relict of William de Wyke below the seat of Bartholomew son of William de Gerston her nephew, pledges her tenement to observe all the laws. Paid double fordele."

"EMMA who was the daughter of Walter Cochela below the seat of the same Walter by the permission (de remissione) of Alicie her sister. Paid double fordele."

"WILLIAM, son of Robert de Slapton, below the seat of his father; fordele paid."

"THOMAS (?) PYN entered the Gild Merchant of Totnes through Florence his wife, below the seat of Richard Stile, father of the aforesaid Florence, whose heir she is, and found pledges to observe all the laws—John de Fonte and John de Wilwey; treble fordele; fine xij^d."

By NOMINATION. "AUBRAYE CROCKELE, by the consent of of the commonalty of the Gild Merchant of Totnes, for the term of his life. Double fordele. Pledges to observe all the laws—Galfrid de la Wodelonde and Thomas de Erper (?)"

"WILLIAM DE SPICER, from the gift of the commonalty of Totnes. Pledges to observe all the laws—John de Fonte and Thomas de Streta."

By GIFT. "By gift, JOHN PARIS, son of William Reda Paris, entered the Gild Merchant of Totnes on the Monday next after the feast of St. Luke the Apostle, in fifth year of the reign of King Edward [II], and found pledges to observe the laws of the liberty—William Paris and John Wylwey; *fordele*."

"AZOUN DE CRIDITONE sits below the seat of Katerine Faci, by the gift of her daughter, Cichelota Faci; *fordele* paid."

"MATILLDIS, daughter of Geoffrey le Taverner, sits below the seat of Richard Lenfaunt, of the gift of Nicholas, son of the same Richard; and the same is to return to the gild after the death of the same Matilldis, for the children born between the aforesaid Nicholas and Matilldis, her pledges being Geoffrey le Taverner and Nicholas Lenfaunt; a double *fordele* paid."

"Be it remembered that ROBERT FINA was put upon the roll as below by Lucy his wife, so long as the said Lucy should live, and if he should survive her he was to have the said gild until such time as he should marry again, and no longer."

"ROBERT FELA sits below the seat of Jordan de la Stocke, of the gift of the same Jordan, *fordele* paid." Above this is written: "He withdrew and surrendered the freedom to the commonalty, and now pays toll."

By PURCHASE. "GALFRIDUS LE FABER, by common purchase. Pledges—Richard Paris and William Gomar; *fordele* paid."

"RICHARD BUREL, by common purchase. Pledges to observe all laws—Thomas de Streta and Robert Filia."

"WILLIAM CRESPIN, by common purchase; *fordele* paid."

From the above examples, which fairly represent many hundreds of entrees, we learn that before admission the new member found sponsors that he would fulfil all the laws and usages of the gild. When these were not forthcoming, as in the case of ALICIA, RELICT OF WILLIAM DE WYKE, the tenement was entered as a pledge. On being enrolled the new member paid a *fordele* or footing; in later days wine was given to drink; frequently a double or treble *fordele* was paid, but there seems no clue to discover the rule, if any, which governed the ratio, although in a few cases of men entering by gift of their wives the high rate is mentioned.

The seat of the new member, which such care is taken to define as above or below that of some other, is rather obscure. In all the accounts of the numerous gilds given by Mr.

Toulmin Smith,* taken from all parts of England, I find no similar case. Mr. Riley † thinks this refers to the seats apportioned to the members of the gild in the body of the parish church, for down to recent times the mayor as representative of the gild assigned seats in the church to the inhabitants. "It is not improbable," he says, "that a certain seat or place in the market was assigned to each merchant." Until very recently the piazzas were occupied by the stalls of various traders, whose right to their "standing" was independent of the owner of the house before which it was situated. A case came to light very recently, where in the deeds of a house it was recorded that the owner, about 150 years ago, bought off the trader's right for £20 to the standing in his own piazza, by which means he could then select his man. This order of seats must have answered as a general rule of precedence at the gild feasts, and on occasions of pageants and processions.

The fifteen gild rolls bring us down to A.D. 1377, and principally consist of these admissions, with the usual entry as to seats, fordele paying, and sponsors. A few interesting facts may be gathered even from these monotonous repetitions, for instance, the name of *William Reda Paris*, whose son entered the gild sometime between the 7th and 12th years of Edward II. (A.D. 1314-18), appears to be an instance of a double surname long before the time such became usual in England.

The Burgesses of Totnes, it will be noticed, have mostly surnames, whereas persons from other places are generally distinguished by the *de*. Some fancy that the insertion of this little particle in a name sounds aristocratic; whereas, in fact, such an insertion really then showed that the family was of such mushroom origin that it had not acquired any true surname, the addition to the Christian name being only used to describe the *individual*, not the *family to which he belonged*. This fact seems therefore to point to a higher social development in the town than existed in the country around. ‡

The frequent occurrence of female names shows that equal rights of the two sexes is no modern idea. As sisters, wives, and daughters they entered the gild; but according to the usages of most fraternities, they might not take part in the

* *English Gilds*.

† Report of Historical Documents Commission.

‡ Vide *Memorials of Names of Old Birmingham*. By Toulmin Smith, p. 13.

deliberation at the "morning-speech" (morgen-spæc) or business meeting.

The first instance of the oath being taken on entry by a member is that of "William Ponderman, who entered the Gild Merchant of Totnes in the above mentioned year [xv. Ed. II., A.D. 1321-2] by common purchase, and gives the commonalty vj^s, and finds pledges to keep all the laws, William de Cobeton and Laurence Cissorur, *and he took the oath.*" The small roll on which this occurs bears many names, and states that the oath was taken by each. The early form of oath is not preserved, but the oaths taken by freemen up to the passing of the Municipal Corporation Act run as follows:

OATH FOR BURGESSES.

"You shall true liegeman be and true faith bear to our Sovereign. . . . Heirs and lawful Successors Kings or Queens of this Realm, and also shall be obedient to Mr. Mayor of this Town and his successors in as much as you are accepted and taken into the Fraternity and Brotherhood of the Freedom and Gild Merchant of this Town. You shall come at all times at Mr. Mayor's commandment and calling (except you have great and urgent business to the contrary) and him shall assist and aid to your powers. The common council of the Mayor and Burgesses which is to be kept you shall keep, and no man under you to cover in occupying any parcel of the liberty of the said freedom or Gild Merchant. These and all other things which a Freeman ought to do observe and perform concerning his freedom and the liberties of this Town you shall well and truly do observe and perform as near as you can. So help you God."

OATH FOR STRANGERS.

"You shall true faith bear to our Sovereign . . . heirs and successors Kings or Queens of this Realm, and also shall be aiding and assisting to the Mayor of this Town in as much as you are now accepted and taken into the fraternity and Brotherhood of the Gild Merchant of this Town; the common council of the Mayor and Burgesses which ought to be kept you shall keep, and shall not keep any man under you in using and exercising any of the liberties of this Fraternity. These and all other things which a Freeman of this Town ought to do observe and perform you shall well and truly observe and perform as near as you can. So help you God."

The customs, ordinances, and usages of the gild seem

never to have been committed to writing, being most probably passed from generation to generation by word of mouth. At the suppression of religious fraternities all these relics of past life were swept away, and the whole subject of gilds became a mystery even to the learned. Several years ago, however, Mr. Toulmin Smith, while following up his researches at the Public Record Office, lighted on some hitherto almost unused bundles of documents, which turned out to be connected with the subject of gilds; for it seems that Richard II. in 1388 ordered a return to be made by the masters and wardens of all gilds and brotherhoods, of all details as to the foundation, statutes, and property of their gilds. These returns were the documents examined, and contain all we are ever likely to know of the internal economy and working of gilds.

Unfortunately among the hundreds examined and translated by Mr. Toulmin Smith, that of the Gild Merchant of Totnes is not mentioned; but still there is a hope that among the labyrinth of the countless thousands of historical records it may some day be brought to light.

Still on the back of some of the rolls of members so carefully preserved in the Guildhall at Totnes, especially of the later ones, a few notes are now and then made of transactions considered worthy of record. The following are a few examples:

"In 3^o year of Edward, William de Cyrecestre the lord of Little Tottoneys [the part without the walls] granted to Walter le Bon [founder of Warland Chapel in A.D. 1270] a bridle path from the mill of Little Tottoneys to Bowdon [Bowden]." It recorded that this was granted in full court.

On a small parchment, entitled "Common Court of Tottoneys holden in 7th year of reign of King Edward II. (A.D. 1313), JOHN HYNGET was charged with selling timber for the bridge of Tottoneys without leave of his partner, and the sanction of the Commonalty of Tottoneys. Whereupon the said John comes and acknowledges the sale; and is awarded by the whole court that he pay six shillings and one half penny for the said timber, the same to go to the use of the bridge; and he gives pledges to the commonalty for the fine." From this it is possible the old bridge was a wooden one which preceded that removed in 1830, although it has been said that old stone-bridges over the Dart were built in John's time.

At the same Court "WILLIAM PERSUM was summoned for cursing Walter Monur, Seneschal of the Gild, in full Court.

Therefore he was adjudged in default and was to be distrained."

"JOHN THE PHYSICIAN (Medicus) was summoned because he had refused the office of constable of the peace. He did not appear; therefore he was adjudged in default and was to be distrained."

It was usual in gilds, where all brethren were equally eligible to hold the highest offices, to inflict a heavy fine on any who refused to act when duly appointed.

The following extract is taken from a small sheet containing legal proceedings of the Court of the Gild, 5th Edward III. (A.D. 1331):

"THOMAS DE WYNBURNE was questioned, for that he sold a pound of Paris candles by weight, the pound weighing 20 pence (or one ounce) less by assize than it ought; seeing that the weight of a pound ought to be 2 marks by goldsmith's weight. Because it is unknown as to the weight let enquiry be made how the citizens of Exeter sell, and the said Thomas has his day until the next Court to hear his verdict."

On a roll of two membranes, the first containing the acts of Court of Commonalty, "holden on Tuesday next of the Feast of St. Luke the evangelist in 7th year of King Edward after Conquest the Third [A.D. 1333], in the time of Geoffrey Scoteneala and John Gilbert, they being the then Wardens of the Merchants' Gild,"—BENEDICT DINYET, and Lucy his wife, are amerced in sum of vi pence, for baking bread and selling it against the liberty. MATTHEW SOR fined iij pence for buying "green lambskins" against the liberty. KATHERINE PERSON amerced iij^d because she brewed beer and sold it contrary to the liberty; pledge T. de Cobeton. WILLIAM PRAGE is amerced vi^d for selling a cask of cider (unum doleum ciseræ) against the liberty without licence. JOHN PARIS amerced iij^d for selling one cask of cider contrary to the statute of the liberty, and he found a pledge.

The next document commences a new era, and consists of two copies of Court Rolls in Latin, having one old seal of Totnes attached to both. One records the levy of a fine in full Court of Sir William la Zouche "among the four benches of the Gildhall," before Robert Frensshe, Seneschal, JOHN RUSSELL, MAYOR, William Brendone, Constable, Walter Sopcombe, Clerk to the Court, and others, 10th Richard II. (A.D. 1386-7). The other membrane records a fine "in full Court of the Borough of Totteneyse," among the four benches of the Gildhall there before WILLIAM RYDER, MAYOR, John

Newhall, "Seneschal of the said Court and Constable of the Castle of Totteneyse," 10th Henry IV. (A.D. 1408-9).

The full development of the Gild Merchant brotherhood into the Mayor and Corporation of the borough had now taken place; the further history of the gild is lost therefore in the Mayor's Court. The freemen of the borough continue to be members of the gild, and to exercise the ancient privileges. They land goods at the town quays free of toll, and had a similar right at Cotton's wharf in London, which appears to be now lost.

ANCIENT DOCUMENTS RELATING TO THE CIVIL HISTORY OF TOTNES.

BY ROBERT DYMOND, F.S.A.

(Read at Totnes, July, 1880.)

“They are the abstract and brief chronicles of the time.”

Hamlet, Act ii. Scene 2.

In the Record Room of the Guildhall at Exeter is a large folio book, in a heavy, substantial binding, measuring eighteen inches by eleven, and containing 365 pages. This portly tome Mr. Stuart Moore, in his *Calendar of the Corporation Archives*, has aptly designated the Common-Place Book of John Hoker. Hoker was a well-known local worthy, “descended of a worshipful house and parentage, and was born in Exeter in 1525.” He was the first holder of the office of Chamberlain of that city, and retained it for forty years, until his death in 1601. He was uncle to the “Judicious” author of *The Laws of Ecclesiastical Polity*, and several other learned treatises. He also represented Exeter in Parliament (1571–81), and wrote that Journal of the proceedings of the House of Commons which was so ably edited by our learned member, Mr. J. B. Davidson, for the last volume of our *Transactions*. The Record Room contains voluminous testimony to the fulness of John Hoker’s knowledge of all that pertained to the history of his native city. The Common Place Book above mentioned is almost wholly in his own handwriting, and its contents are mainly founded on the great mass of records in his official keeping. Although the book is chiefly devoted to Exeter, its second article relates to Totnes; and as Hoker’s account of this town precedes in point of date those produced in the early part of the next century by Sir William Pole, Westcote, and Risdon, and has never yet been printed, the present appears to be a fitting occasion for bringing it to light. It runs as follows:

"THE DESCRIPTION OF DODNEYS AND OF THE CHARTERS AND
LIBERTIES OF THE SAME.

"Dodneys, but now commonly and corruptlye called Totneys, is a verie auncient Burroughe and a famosē Empore or merchant Towne lyeinge yn the southe hammes of the province of Devon or Damnonia. It standeth and is buylded vpon the side of a Stonye hill declyninge from the west unto the Easte and is opposite agaynst the Easte & the sonne rysinge and whereof it taketh his name being called Dodoneys, that is the Stonye hill, and not Totneys, w^{ch} is borrowed of the french tonge as some etimologise it, signifieinge all yn neste or peap [?]. Of the fundacon thereof there remayneth no memoriall

*The scituacion
of dodneys or
Totnes.*

*The antiquitie
of the towne.*

but it had his beginynge, as other lyke buroughes had, when people for their saiffitie & the conservacon of comon societie did first buyld cities and Townes: how be it some do hold opinion that it was builded by Brutus or Corineus who at theire first arryval yn to this Land did firste seysen & take Land at this Towne and there builded the same; but whether Galfridus Monmuetensis opinions and reportes be of credite I leave vnto others to dyscerne it and leave herein everie man to his owne censure. In it there is onely one streete conteyninge yn lengthe aboute some [blank in original]. In the higher ende there is an

*The Castle; by
whom it was
buylded.*

old auncient Castle, but by whom it was first buylded, whether by the first inhabitantes or by the kings of this realme yn whose demeanes the saide Towne was, or by Iudhill unto whom the king first gave the towne to be holden of hym or by the Lady Melesont Monhaut, the lord Cante-lope or the lord Zouche, who all in their descentes were lordes of the Towne it doth not appeare: But it was buylded ether by the inhabitantes of the same for the defense of theym selffes and of their Towne when before the Conquest the Danes & fforeyn enemyes used invasions and excersysed greate cruelties as well yn this west countrie as yn other places of the Lande or by some one of the Lordes (betwene whom and the Towne there arose many tymes sundry contentions and controversyes) and they for theire commande of the Towne did buyld the same. At the lower ende

*The ryver of
Darte some-
tymes navig-
able.*

of the Towne fleeteth the Ryver of Darte w^{ch} yn tymes paste was navigable for shippes of greate bourdon but nowe almost decayed and yn the ende lyke to be utterly destroyed, oneles the remedies provided by lawe be yn

*The ryver
gratelye
decayed by
Tynneworkes.*

due tyme taken & used, by the reason of the many sundrye Tynneworks in Dartmore where this Ryver springeth & ryseth w^{ch} is stopped and quieted wth verie great abundance of sandes w^{ch} by washing of there streame works ar conveyed and do fall yn to this meane [main] River. This River before it be dyschardged yn to the highē seas passeth

by the Towne of Dartmouth, beinge the mouthe of the haven and
*Dartmouth is
 appendant
 sometymes
 parteyninge to
 Totnes.* whereof it taketh his name and this Towne was some-
 tymes appendant and appertayninge unto Dodneys
 Towne and altogether vnder the Jurisdicion and gover-
 nment of the cheef magistrates and burgesses of the
 same vntyll such tyme as one Nycholas Toukesbury dyd buye &
*Dartmouth is
 purchased of
 the lorde of
 Totnes.* purchase it, to the use of the inhabitants of the saide
 Towne, of Willm Lorde Zouche Lorde then of Dodneys
 by w^{ch} meanes the saide Townes were dysevered and
 dystincted thone from the other and had everie of theym theire
 severall [i.e. separate] lyberties priveledges & customes and yn
 the ende their severall charters procured from the kynges of this
 realme and then as severall burroughes townes they did yeld everie
 of theym the severall burgesses to appeare yn every of the highe
 courtes of parliament. The government of the Towne of
*The auncient
 government of
 Totnes.* Dodenays was yn the tyme of the Saxons, as was of
 every other burrough Towne in those dayes w^{ch} was,
 under some one principall officer who then was named a portegrave,
 that is to say the auncient or principall man of the Towne and by
 hym all matters of controversie were decided and the publyke
 government directed. Immediately after the Conquest
*Portegraves
 seneschalls
 bayliffs
 mayors.* William the Conqueror changed this name and called
 theym Seneschalls and not long after Bayliffes, but yn
 the ende & nowe are named Mayors, w^{ch} is nowe the most
 principall name geven to the cheef officer of all cities and townes.
 This muche concerninge the seate, antiquitie and origene of the
 Towne of Dodeneys, and nowe concerninge their Charter, their
 lyberties and priveleges, w^{ch} ar as foloweth :"

After this follows Hoker's Latin abstract of documents
 descriptive of the rights and liberties of the borough, but of
 this it is only necessary to give the English marginal notes
 by which the abstract is further epitomized. These are stated
 in the following order :

Totnes is auncient demeana.

The burgesses be free of toll throughout the realme.

The burgesses be free from the Sheriff's turne.

The liberties intruded upon.

The burgesses have a bailiff.

The bailiff hath the return of writes.

All matters of what valewe soever to be tried in the towne
 courte.

The castle and borough of Totnes is holden of the king in chief.

The towne is a free towne and hath markets, fairs, pillorie, cart
 & forches [i.e. gallows], and free Burgesses.

The lorde of the towne hathe the viewing of the assize of bread
 & wyne, strangers, &c.

He hath wrecks & customs of ships.

He hath presages of wine.*

A free warren.

Gavelkynde lande.

He hath a free market at Dartmouth, a pillory, a cart, &c.

He hath the port of Dartmouth and the custom of all merchandize.

Eastergavell, Thongavell, Chepegavell, Histgavell.

Hoker's references to Totnes close with the following :

"Memorand : that kinge henry the thirde by his lres patentes dated at Northehampton the xth daye of Aprill yn the xlvij yere of his reigne dyd geve vnto the burgesses and inhabitantes of the Towne of Totnes lybertie and leave to inclose the Towne wth a wall and towards their helpe and chardges therein dyd geve theym a certeyn custome called Murage of all such wares and merchandises as shold be brought to the saide Towne by Lande or by water."

Here we part from Hoker. His account, though possessed of a certain value as a historical curiosity, is eclipsed in importance by the more ancient records of which he has merely given brief abstracts. These records are of so interesting a character that they merit much fuller notice than has been bestowed on them by Hoker. In compiling the following ampler account of their contents I have received the critical and scholarly aid of Mr. J. B. Davidson and Mr. Stuart Moore, F.S.A. The documents themselves are deposited in the Record Room of Exeter Guildhall, and are copied on a paper roll bound in two parchment leaves of a fine fourteenth century copy of Higden's *Policronicon*, which, with its illuminated initial letters, is itself a curiosity of mediæval caligraphy.

The first leaf of the roll is headed, "Compilacõ p Joh'em Burhed L'an 1433." From Mr. Edward Windeatt's diligent researches we learn, that eight years after he employed himself in making these copies of the ancient records of the borough, John Burhead was elected its mayor. He seems to have worked for Totnes in the same way as John Hoker worked for Exeter. It is by the industry of John Burhead that his townsmen are now enabled to learn what these records dis-

* *Prisage of Wines*. A word almost out of use, now called *Butlerage* (because the king's chief butler receives it), which is a custom whereby the king challenges out of every bark laden with wine, containing twenty tuns or more, two tun of wine, the one before, the other behind the mast, at his price, which is twenty shillings for each tun ; yet this varies according to the custom of the place.—BLOUNT's *Glossary of Law Terms*.

close of their early municipal history; and it is probably owing to the care of John Hoker, of Exeter, that these records have been preserved to the present day. Burhead's labour in transcribing them was, no doubt, prompted by jealousy for the rights and liberties of the town. That he was a popular and efficient mayor may be inferred from the fact that he was elected eight times in the ten years intervening between 1441 and 1450. How or why his "Compilation" came to be transferred to Exeter, and passed into the custody of John Hoker, does not appear. As they flourished nearly a century apart, the two scribes could have had no personal knowledge of each other, but both deserve the thanks of the present generation for the good work they respectively did in their own.

I. The first article of the "Compilation" consists of a curious chronological account of the ages of the world, commencing with the creation, and proceeding by successive stages of biblical history down to the time of Brutus and Corineus. Here the compiler gives a version of the fable derived from Geoffry of Monmouth, relating how Brutus and Corineus landed at Totnes, and found the island inhabited by a race of giants. The chronology proceeds to the founding of Rome and London, the invasion of Britain by Julius Cæsar, the birth of Christ, and ends A.D. 46, when the Virgin Mary was taken up (assumpta) into heaven, in whose honour the church of Tottoneys was dedicated. The chronology is curious, but full of errors.

II. After this follows an extract from the Exchequer Domesday of the paragraph relating to Totnes, under the head of "Terra Judhel de Totenais." Burhead calls him *Ludhel*. As the entry in Domesday is readily accessible, it is unnecessary to repeat it here; but it may be noted that, in giving the last sentence, the writer introduces words, here printed in italics, which are not found either in the Exchequer or the Exeter copy of the original. "Ipse Ludhel habet in Excestre unam domum que tempore Regis E reddebit [sic] viij^d de consuetudine, *Totton' le Taberd.*" John Hoker, in transferring this sentence to his own book, varies this interpolation, so as to place the Tabard in Exeter, thus: "Ipse Judhel habet in Excester unam domum *vocatam Le Tabbard,*" &c. This passing observation is chiefly noteworthy as showing that when Chaucer wrote of the departure of the Canterbury pilgrims from the Tabard, in Southwark, there existed, either in Exeter or at Totnes, another house (probably an inn) bearing the same sign.

III. Next follows the Charter granted to the town of Totnes by King John, and of which the late Mr. William Cotton gave, in his *Historical Sketch*, page 88, an English translation, differing but slightly from the (apparently somewhat faulty) Latin copy of John Burhead. The original charter appears to have been lost, and it is not even catalogued at the National Record Office in London.

IV. After this come some observations by Burhead, the gist of which is given in the following translation: "The burgesses have been accustomed to be free from the said toll [*i.e.* the toll or custom mentioned in the charter] in all towns &c., by land and water, and have not been in any Sheriff's tour from the foundation of the borough, till Walter le [*sic*] Bathe, Sheriff of Devon * and Escheator, entered it at the time when the Castle of Totton' and the knight's fee were in the king's custody by the minority of George de Cantilupe. The burgesses used [are accustomed] to answer by twelve jurors before the King's Justices, and they have Bailiffs who answer for the borough and received the estreats and summonses by which the king's debts are demanded, and answered for the same and all other summonses and attachments: and [they had] the return of writs."

The remainder of the series supplies much information respecting Totnes at a period of its history of which little has hitherto been made public. The documents themselves are believed to be unique, and the following English translation will put the reader in full possession of their contents.

V. *Pleas of Quo Warranto before Solomon of Rochester and his Associates*, 9-10 *Edw. I.*, at *Exeter*. [There is a short abstract of this in the Quo Warranto Rolls in London, and it is mentioned in the printed calendar.]

Milesenta de Monte Alto † claims to hold the Castle of Totton' with the Fee adjacent and the Borough of Totton' of the Lord the King in chief, and to have there a free borough, free burgesses, a free market and fair, a pillory, tumbrel, and gallows [*furcas*], a free court, and other liberties and free customs appertaining to a free

* A Walter de Bathon' was Sheriff of Devon from the 21st to 35th Henry III. (1237-51.) The name reappears in the list of Sheriffs 18th Edward I. (1290), and again 18th Edward II. (1325). *POLE's Collections*, 92-4. If Burhead is right as to the name, it must have been the first-mentioned Walter de Bathe who intruded on the liberties of Totnes.

† William de Cantelupe obtained the lordship of the Castle and Borough of Totnes by his marriage with Eva, sister of Reginald de Braose, and, on the death of their son George, it passed to their eldest daughter, Milisent, who married, first, John de Monte Alto or Monhaut, and secondly, Endo or Ivo de la Zouche.

borough, market and fair, and amends of the assize of bread and ale broken, estray, infangenthef, utfangenthef,* and wreck of the sea from the bridge of Totton' to Blakeston without Dertemue [Dartmouth], and customs of ships and boats arriving there. Also she claims to have at her Castle of Totton' prises of bread, wine, and ale, and of other victuals when she shall be there, for forty days, and prises of brushwood [busce] coming to market throughout the year. Also she claims to have free warren in all her demesne lands in Devon. Also to plead in the said Court of Totton' dowers, metes broken, and reasonable purparty without writ among heirs within a year and a day. She holds the said borough in purparty with John Hastynges, who is under age and in the King's custody, and who has lands to [equal] value in other counties, of the inheritance of George de Cantilupo, brother of the said Milisenta, and uncle of the said John; which George died seized of the said liberties and free customs.

She also holds the manor of Corneworth, &c. Also various liberties at Dertemue (set out). She has a certain port at Dertemue as appertaining to her Castle of Totton'.

Milisenta de Mohaut was summoned to answer to the King by what warrant she holds the *filum aque* of Dertemue and takes toll of men passing there, and divers other customs, without licence. She replies (by attorney) that she holds of the inheritance of George de Cantilupo, &c. She was also summoned to answer by what warrant she claims to have view of frank pledge, gallows, amends of the assize of bread and ale broken, a tumbrel and pillory in Totton', and free warren, [and] wreck of the sea in the demesne lands there, without licence. She says that she holds them of the said inheritance. Therefore it remains until, &c.

VI. *Verdict concerning customary rents [due] to the Lord of Totton'.*

Verdict of jurors at Totton' made before the Lord Martin de Leg' Knight (militibus) and the Lord Elias de Cumba clerk, Bailiffs of the Lord Edward son of King Henry, on Saturday after St. Giles, in the 39th year of King Henry [III.] (Names of jurors given.) *Estergavell.* First they say that a certain rent of assize, which is called Estergavell, is rendered from every burgage, [viz.] 2^d by the year at Easter; so that if any one holding any such burgage shall have died, his heir or heirs, as long as they shall be willing to be united (unanimus) in the said borough (burgage?), shall give of relief 14¹/₂^d at the most (ad plus?); and when they shall wish to divide the said borough (burgage?), each shall give for his part a relief according to the fine which he shall be able to make under 14¹/₂^d. And be it known that the said rent in every year increases and decreases.

* Liberty of trying thieves taken in the lordship, whether the robbery be committed within or without its limits.—BLOUNT.

Sum by estimation of the said rights (jur) 46^s 2^d with the tithe.

Frygavell. There is a certain rent at Totton' called Frygavell payable at the feast of St. Martin, to wit, from every burgess having a wife 2^d. And by reason of that liberty called Frygavell * the wife of the same burgess can be [in] his suit to bear witness against his adversaries. If the said burgess dwell within the town without a wife he shall give 1^d. If he dwell without the town he shall give nothing. Sum 20^s with the tithe.

Thangavell. A rent called Thangavell; † viz., from every tanner 2^d at the feast of St. Martin. Sum 2^s 8^d with the tithe.

Chepgavell. A rent called Chepgavell: ‡ every merchant who is in the mercantile Gild of Totton', not having a tenement there ought to render yearly 6^d at four terms of the year; and when he shall have acquired a tenement, he shall be quit from the said rent. And he shall render 2^d of Estergavell. Sum 20^s 6^d with the tithe.

Hystgavell. This is due from certain curtilages at the nativity of St. John the Baptist; viz., $\frac{1}{2}$ ^d from each. It is a certain rent. Sum 12^d with the tithe. §

Escheat. There is a certain escheat from a certain house of Thomas de Strete, because a certain woman named Bonaneya dwelt in Poitou and had in the said house 2^s of rent, and not more. Sum 2^s with the tithe.

Also they say that William Armiger is bound yearly to render 6^d of new increase of a certain curtilage.

The farm of the fishery with the rushes (irundine) used to be worth 5^s yearly: it increases and decreases. Farm of the water 2^s yearly with the tithe. Sale of herbage in the garden 4^s. Sale of rushes (irundinis) 8^d with tithe. Sale of the Lord's meadow yearly 4^s with tithe.

Issues of the mill grinding malt, 4^s 4^d 2^d yearly without tithe, and without the support of the mill and the stipends of the miller and his boy, allowed at 18^s. The burgesses of Totton' are not bound to do suit to the said mill.

The township of Totton' renders yearly 4^s at four terms for all tallages, "ita quod burgenses prædictæ villæ in omnibus placitis sine occasione sint deducti." If any shall be amerced he shall give 14 $\frac{1}{2}$ ^d at most, unless burning a house be in question, and then he shall give 2^s 6^d.

The custom of the market on Saturdays and other days is worth yearly 37^s 9 $\frac{1}{2}$ ^d.

The custom of the bridge 7^s with tithe.

* Frygavell = Free-gavell or tolls, and so named at a subsequent date with a different interpretation.—See Mr. J. S. Amery's paper on the "Receiver's Accounts," in which the Easter gavel or toll is also mentioned.

† Thangavell = Tan gavel or toll.

‡ Chepgavell = Chepe or market toll. This is also mentioned in Mr. J. S. Amery's paper.

§ Hystgavell. This toll is unknown except as above explained.

The custom of the fair (nundinarum) 40*

Perquisites of the Court of the Borough 48^d 9^d, and were never tithed.

Perq^t of the Knight's Court 6^s 8^d; never tithed.

The Lord of Totton' is bound yearly to render to the Prior and Convent of St. Nicholas, Exeter, two marks,* and to the heirs of Robert Bozon half a mark, and to the Lord of Dartyngton 1 lb. of wax or 6^d "pro recursu aque molendini super terram de Dartyngton."

The heirs of Robert Niger and of William le Bon ought (are entitled) to grind at the mill of Totton' certain quantities of malt quit of toll, because the mill was built on their land and the watercourse is taken (ducitur) through their land.

The burgesses ought to be free from toll in all towne, &c., and from the Sheriff's tour, &c. (As before. See pp. 194, 197.)

They have a liberty called a mercantile Gild, whereby they can make strange merchants free of toll. They can amend their plaints on the first plea-day in the Court before the Steward. In the Court of the Lord of Totton' they can plead all pleas which are pleaded before the Justices in the Common Pleas.

VII. Charter of King Henry concerning Murage.

The King grants to the Bailiffs, burgesses, and "probi homines" of Totton', in aid of enclosing the town, that for five years they may take therein, for mending the walls, certain sums from corn, horses, cattle, hides, salt-meat, fish, hogs, cloth, silk, wool, and other things sold in the town. Northampton, 10th April 48th year [of Henry III.]†

"Composition of Exchange of the Water of the Port of Dertemouth.:"

Between William la Zouche Lord of Tottenys of the one part, and Nicholas de Toukesbury Lord of Hewys of the other part. The said William granted to Nicholas all his messuages and rents in Clyfton Dertemouth and Hardenap, and all the toll, custom, and profits of the market, and the free Court of pleas and complaints, the assize of bread and ale broken, &c., in the said towns; also the toll, customs, &c., of the Port of Dertem[outh] and Dert from a place called Blakston next the entry of the port to Blakston next Corneworthy, with a free Court, with all appurtenances, &c.; saving that the said William and his heirs and the Burgesses of Totton' shall be quit from the said tolls, customs, &c., and that all men coming by sea in ships, barges, or boats with merchandises, shall have free passage from Dertem[outh] to Tottenes without

* Not mentioned in the Rev. Dr. Oliver's account of St. Nicholas Priory, in his *Monasticon*.

† Compare this with Hoker's account, *ante* p. 195.

malicious impediment. To hold to the said Nicholas his heirs and assigns of the chief lords of that fee by the services due and accustomed, &c. For this gift the said Nicholas grants to the said William his heirs and assigns 16 marks of yearly rent from his Manor of Hewys. Clauses of warranty and distress. Names of witnesses. (No date.)

"Grievances formerly done to the Burgesses of Totton'."

First, the said Burgesses feel themselves aggrieved by former Bailiffs of the Water of the Port of Dertemue because they distrained and pledged the burgesses to pay toll contrary to immemorial custom until the exchange between the present Lord [of Totton'] and Nich. Teukesbury; and afterwards for a long time they were quit until the Port of the said Water came into the King's hands by the death of Peter Gavereston. The present Bailiff Robert Abbot of Tavystok and his under bailiff do the same. Also the Bailiff of the Hundred of Colryg enters the liberty of Totton' and makes summonses and distresses of the burgesses to be in assizes juries, &c., contrary to the Lord's liberty which he and his ancestors had by charters. The burgesses used not to be vexed to [attend County [Courts] nor elsewhere before Justices save for pleas, &c., arising in the borough.

VIII. The said Burgesses, on a rumour that the King's tin by tinmen (stagniatores) and others was sold and brought by night and day, not marked, at the time when it was forbidden by the King that tin should be marked or sold, except "Lumberd," by the common counsel of the Lord's Bailiffs and of the Commonalty, constables of the peace, and Sheriff, [summoned] a jury of 12 men and other trustworthy men of the Hundred, who indicted John Janet and Ivo Hyne to be guilty of the said fact. Janet afterwards came to Totton', and the burgesses made search, and found seven pieces of tin next the Chapel of Saint Peter in Parva Totton' hidden in a stable, dungheap, and elsewhere. By precept of the Sheriff and Coroner he was sent to Exeter Castle. How he was delivered they know not. The deputy-sheriff delivered the tin to the Bailiffs of the Stannary by the King's writ. And now Thomas de Scyrygge * impleads and grieves [the burgesses], making the King party to his suit, charging them with having unjustly imprisoned Janet; and he causes the Bailiffs of the Stannary to summon the burgesses to their Court at "Aysch' perton," to the prejudice of the Lord and of the liberty of the borough.

The Bishop of Exeter has a market at Peyngton, and John de St. Edmund Lord of Yppelapen has a market there, to the prejudice of the Lord and Liberty of Totton; "therefore, &c."

* See reference to Thomas de Shirrige, Custos of the Bailiwick of Dartmoor, the Coinages, Stannaries, &c., in my paper on "Historical Documents Relating to Dartmoor," in vol. xi. p. 379 of our *Transactions*.

Also the stannary-men (stagniatores) claim to be quit from toll for all things bought and sold in the market and fair, whereas they ought not to be quit, save for purchases made for their sustenance, and for the work of the Stannary; "therefore, &c."

The burgesses have the election of ale-tasters, but the Steward and Bailiffs amerce all brewers whether presented by the tasters or not, contrary to the composition between the Lord and the burgesses.

They have a constable of the peace to present hue raised, and the Bailiffs compel the constables to say whether it was justly raised or not, and amerce the party without hearing in Court.

The burgesses pray that they [the Steward and Bailiffs?] may desist from the aforesaid errors, lest they fall under the sentence of excommunication passed after the Charter of the Liberties of England. The burgesses pay to the Lord four pounds of silver to have their ancient usages and customs.

IX. Composition between the Lord of Totton' and his Burgesses.

Know all men that whereas William Lazouch Lord of Totton' felt himself much aggrieved by his Burgesses, especially in certain articles underwritten in which strifes and contentions had arisen between them, nevertheless it is thus settled.

The Lord charged the Burgesses with claiming liberty to acquit divers strange men from toll and other customs in the Lord's market and fair, for a year and a day, rendering nothing to the Lord, and afterwards 6^d yearly. The Burgesses and Commonalty grant that they shall receive no one into the said liberty who has residence elsewhere, to wit, wandering merchants, who shall take oath to acquire a tenement in Totton' within the first year and a day, before the Steward of the Mercantile Gild and the Lord's Bailiff; and so from year to year so long as they do not acquire a tenement.

The Burgesses claimed to prove measures weights and ells without the precept of the Lord's Steward; but grant that the Lord's Steward or Bailiff, with the Reeve of the town and "cachepoll," shall send [for] the Steward of the said Gild or two burgesses and meet at the Guildhall, and then take the measures weights and ells throughout the town to the said hall, there to be proved by the Standards in the custody of the Steward of the Gild; any found false to remain in the Reeve's custody till the Lord's next Court, and there to be condemned, and the owners to be punished. If the Lord's Steward or Bailiff, sooner than the Cachepoll or Reeve, shall come to the town on any one's complaint or suspicion, to prove such measures weights and ells, they shall take the same to the Lord's Court, whither the Steward of the Gild is to take the standards, &c.

The Burgesses claimed amends of the assize of bread, to the Lord's disinherittance; they grant that they will not demand the

same henceforth, but the assize shall be caused to be kept by the Lord's Bailiff with the Reeve of the borough, and offences shall be amended in the Lord's Court, the Lord enjoying the amercements; punishment to be made by tumbrel and pillory; the Bailiffs to take bread and the weight of bread as often as necessary, and not the Burgesses, except perchance any one of them shall find bread of which he has suspicion, when he shall take it to the Reeve of the town, who shall carry it to the Lord's Court.

If any malefactor or thief shall be taken in the Lord's market or fair and be adjudged to the pillory by the Steward and Bailiff, Reeve and Cachepoll, and by the consideration of the said Burgesses, judgment shall be executed: if the Steward or Bailiff cannot attend, execution shall be made.

Dated at Totnes 6 July, 32 Edw. I. The witnesses are Gilbert de Knonill, Nicholas de Kirkham, Roger de Cokyngham, Hugh de Ferrers, knights, John de Holdesworthy, Ralph de Dodescombe, William de Penelles, William de Pyn, Richard de Bonelegh, John de Hagworthy et aliis.

X. *"In the — year of the reign of King Edward son of Henry."*

On Tuesday before St. Thomas Apostle John Gander came to the Chapel of St. Edmund on the bridge of Totton' and took away the vestments, and fled to the manor of Byry. He was taken to prison, and died there.

On Saturday before Nativity of St. John Baptist Richard le Rede of Lymyneford "cidit Chopyn et capf cum burg."

On Tuesday before Nativity of B. Mary 66 men came to the Priory of Totton' and despoiled it. John and Henry le Tailleur joined the said malefactors, and were taken to Exeter Gaol.

At the County [Court] at Exeter on Tuesday after the Nativity in the 11th year of King Edward, the Bailiff of the Hundred of Colrygge was ordered to attach the Bailiffs and all the Commonalty of Totton' to appear at the County [Court] to answer why they had not appeared before the Sheriff of Devon in his Tour at Totton' in that Hundred. They appeared at the next County [Court], and put themselves on an Inquisition that they ought not to attend the Sheriff's tour. Names of the Jurors: who found accordingly. Judgment for the Bailiffs and Commonalty. In witness whereof the Sheriff Matthew de Clyvedon affixed his seal "to this writing" at Exeter Castle, Tuesday, the eve of St. Peter in Cathedra, 11 Edw. [I.]

XI. Copy of the King's Charter 14 April, 15 Edw. III. 1341, to the Town of Dartmouth. This charter is interesting as regards Dartmouth, but contains nothing relating to Totnes.

THE LANDING OF THE PRINCE OF ORANGE AT BRIXHAM, 1688.

BY T. W. WINDEATT.

(Read at Totnes, July, 1880.)

THE landing of the Prince of Orange, the Prince who "saved England," on the shores of Devon, in 1688, must always be a matter of interest, not only to the historian and to the lover of civil and religious liberty, but more or less to all Devonshire men; and although there may be little new to be said upon so important an episode in the history of our county, the fact that this "*Devonshire Association*" is now meeting within a few miles of the historic scene of the landing, the once small fishing village of Broxholme, is, I venture to think, a sufficient justification, if one be needed, for my introducing this subject to your notice, and endeavouring to preserve, through the records of this Association, some facts connected with it, and some local anecdotes or traditions which do not appear to have obtained very great publicity.

The subject has been dealt with by Macaulay and other historians with more or less detail, and I find that at the meeting of this Association at Torrington, in 1875, it was brought before you by Mr. Pengelly, in part I. of "*Miscellaneous Devonshire Gleanings*," when he noticed two interesting papers, the first entitled "*The Expedition of the Prince of Orange for England* ; giving an account of the most remarkable passages thereof, from the day of his setting sail from Holland to the first day of this instant December;" and the second, "*A further account of the Prince's army in a letter sent from Exon, dated Nov. 24th.*" I certainly should not therefore have ventured on the subject myself had it not been for the fact of having had placed in my hands, through the courtesy of Mr. J. B. Davidson, of Secktor, a somewhat rare pamphlet, containing many interesting facts not noted in the papers referred to by

Mr. Pengelly, and from my being the repository of some local anecdotes worth preserving.

The pamphlet I have referred to is entitled, "*An Exact Diary of the late Expedition of His Illustrious Highness The Prince of Orange (now King of Great Britain), from his Palace at the Hague to his Landing at Torbay, and from thence to his arrival at Whitehall. Giving a particular account of all that happened, and every Day's March. By a Minister Chaplain in the Army.*" It consists of 73 pages; was printed for Richard Baldwin, near the Black Bull, in the Old-Bailey, in 1689; licensed April 23rd, 1689. It is dedicated to the Earls of Bedford and Portland, Viscount Sidney of Sheppy, and Sir John Maynard, one of the Lords Commissioners of the Great Seal, and from the Dedication it appears that the writer was one "John Whittle."

This Sir John Maynard was at this time Recorder for this borough, and member for the borough during the Long Parliament. He was a very able lawyer, and at this time near ninety. It is related of him that when he came "with the men of the law" to welcome the Prince, the latter took notice of his great age, and said that he had outlived all the men of the law of his time. Whereupon Maynard replied, he had like to have outlived the law itself if his highness had not come over.

That this pamphlet is genuine, and was written by an English clergyman who accompanied the expedition throughout, there is strong internal evidence; and Macaulay cites it as one of the authorities for several of his statements with reference to the expedition, though he does not quote largely from it. While the two papers referred to by Mr. Pengelly appear to have been familiar to most writers on the subject, this diary does not appear to have been so well known, and my own experience in endeavouring to obtain a copy of it is a proof of its present rarity. When first contemplating this paper, some two years ago, and finding the diary set out in the *Bibliotheca Devoniensis* as being in the library of Magdalen College, Oxford, I wrote to the librarian, enquiring if it was to be found there, and if he would give me extracts from that part of it referring to Devonshire. He very courteously replied in the affirmative, and allowed a copy of it to be made for me. When I received it, however, I discovered that instead of its being the pamphlet I was seeking it was one of those referred to by Mr. Pengelly, the greater portion of which I already possessed in print in the *Transactions* of this Association. Strict search was then made for a copy of this diary at Magdalen College Library, at other college libraries at

Oxford, and at the British Museum, but in vain. I therefore gave up the idea of finding it. Happening however to mention the circumstance to Mr. Davidson, at the meeting of the Association at Ilfracombe, he promised to look it up for me, and in a short time he forwarded me a copy, which was in the Secktor library.

In this diary, or more strictly narrative, which goes much fuller into particulars than the other pamphlets, Mr. Whittle gives a graphic account of the arrangements for, and the departure of, the expedition, the storm which sent it back again, its refitting, second departure, and safe (if not miraculous) arrival in Torbay, to all of which the writer was evidently an eye-witness. Some eleven pages are taken up with an introduction, setting forth the causes leading to the expedition, and establishing the clerical character of the writer by a considerable amount of sermonizing, in which the Prince is compared to Joshua, Josiah, and David.

In the first paper quoted by Mr. Pengelly the fleet is said to have consisted of "51 Men-of-war, 18 Fire-ships, and about 330 Tenders, being ships hired of merchants for the carriage of horse and foot, arms, ammunition, &c." Mr. Whittle, who is somewhat more specific, puts it in the following manner: "The number of our capital ships or men-of-war was about fifty, which were very well rig'd, mann'd and provided with all things requisite; the number of our fire-ships was about five and twenty; lesser Men-of-war or Frigats about six and twenty; the number of Merchant Ships, Pinks, Flyboats and others was about three hundred and odd; so the total number of the Fleet as they sailed from the Brill was about four hundred and odd ships. But at our setting out the second time, at Hellevort-Sluys, there were near an hundred vessels more, which were Schievelingers or Boats which the Fisher-men of Schieveling went to sea in."

Whittle gives the following account of the final departure of the expedition:

"Upon Thursday, Novemb. 1, Old Stile, Novemb. 11, New Stile, after the Prince of Orange had din'd with all English, Dutch, Scotch, and French Lords, Knights and Gentlemen attending his Sacred Person, about three or four of Clock in the Afternoon, he went on board a new Vessel of about Twenty-eight Guns, with the Rotterdam's Admiral, call'd the Brill, as some will have it, and being now in his Cabin, fired, for to give notice unto all the Fleet to weigh their Anchors and make Sail, which was accordingly done by every Ship with all possible expedition. The whole Fleet was divided into three Squadrons; the Red Flag was for the English and Scotch,

commanded by Major-General Mackay; the White Flag was for the Prince's Guards, and the Brandenburgers, commanded by Count Solms; the Blew Flag was for the Dutch and French, commanded by Count Nassau. Now every Ship had a certain Mark, or Token, that it might be known unto what Squadron she belong^d.

So once more the whole Fleet (thro' God's blessing) was under sail for England, with a very favourable East Wind. The darkness coming on us, all the Ships set out their Lights, which was very pleasant to see, and the Ship in which the Prince of Orange was, had three Lanthorns, the Men of War two, and each other Ship one."

Whittle brings the fleet to the English shores and thus continues:

"On the Morrow-morning, being the Lord's day, Novemb. 4, Old Stile, which was the happy Birth-day of his thrice Illustrious Highness, the Prince of Orange; most men were of opinion that we should land either in the Isle of Wight, Portsmouth, or some other convenient place, about which matter they were much mistaken, for the Prince of Orange did not sail, but observe the duty of the day; so all were driven of the Waves. Prayers and Sermon being done, he went to Dinner with some Nobles attending him, and about Four of Clock in the afternoon made sail, all the whole Fleet following the example of his ship; now every Schipper endeavour'd for to keep sight of the three Lanthorns or Admiral of Rotterdam's Ship for the sake of his Highness therein. The darkness shutting upon us all our Lights were set out as before."

Whittle then brings us down to the morning of Monday, the 5th of November, and proceeds as follows:

"So when the day began to dawn, we found that we were very near the English Shore, but whereabouts we could not yet tell. The Ship in which the Prince of Orange was sailed so near the Shore that with much facility a man might cast a stone on the Land; we were driven very slowly, all our Sails being struck. The Morning was very obscure with the Fog and Mist, and withal it was so calm that the Vessels now as 'twere touch'd each other, every Ship coming as near unto the Ship wherein the Prince of Orange was as the Schipper thereof would permit them. Here we were moving for a while very slowly by the Shore, and could see all the Rocks thereabouts very plain. We perceived that we should land thereabout, but no place near was commodious for either Men or Horses, it being a steep Rock to march up. The Ships did all observe the motion of the three Lanthorns, which were driven by the Coast of England back again, for we had sailed somewhat beyond Torbay. And being thus calm'd for a while, it

afterwards pleased the God of Heaven, that he gave us a West or Westerly Wind, which was the only Wind that could blow to bring us safe into the Bay ; for even to this place we had an East and South-East Wind, which was indeed a good Wind to bring us from Holland, and along all the Channel, but not to carry us into the Bay, there were so many Rocks and Shelves on that side. Making some Sail again, his Highness the Prince of Orange gave order that his Standard should be put up, and accordingly it was done, the White Flag being put uppermost, signifying his most gracious offer of Peace unto all such as would live peaceably : And under that the Red or bloody Flag was set up, signifying War unto all such as did oppose his just Designs. The Sun recovering strength soon dissipated the Fog, and dispers'd the Mist, insomuch that it prov'd a very pleasant Day. Now every Vessel set out its Colours, which made a very pleasant show. By this time the People of Devonshire thereabout had discovered the Fleet, the one telling the other thereof ; they came flocking in droves to the side or brow of the Hills to view us : Some guess'd we were French, because they saw divers White Flags ; but the Standard of the Prince, the Motto of which was, For the Protestant Religion and Liberty, soon undeceived them.

“ Others more discreet said, that it was the Dutch Fleet so much talk'd of in the Nation, and so long expected by most people. This Day was very remarkable in England before, being the fifth of November, the Bells were ringing as we were sailing towards the Bay, and as we landed, which many judged to be a good Omen : before we came into the Bay's mouth, as we were near the Rocks, the People ran from Place to Place after us ; and we being so near as to see and discern the Habit of the Country People, and they able to see us and hear our voices, a certain Minister in the Fleet, on board the Ship called the Golden Sun, went up to the top of the uppermost Cabin, where the Colours hang out, a Place where he could easily behold all the people on the Shore, and where they might most perfectly see him, and pulling a Bible out of his Pocket, he opened it, and held it so in his right Hand, making many flourishes with it unto the People, whose Eyes were fix'd on him, and duly observ'd him, thereby signifying to the People the flourishing of the Holy Gospel, (by God's Blessing upon the Prince of Orange's Endeavours) and calling out as loud as he was able, said unto them on the top of the Rock : For the Protestant Religion, and maintaining of the Gospel in the Truth and Purity thereof, are we all by the Goodness and Providence of God come hither, after so many storms and Tempests : Moreover, said he, It is the Prince of Orange that's come, a Zealous Defender of that Faith which is truly Ancient, Catholic, and Apostolical, who is the Supream Governour of this very great and formidable Fleet. Whereupon all the People shouted for Joy, and Huzza's did now echo into the Air, many amongst them throwing up their Hats, and all

making signs with their Hands. So after the Minister had given them some Salutations, and they returned him the same again, he came down from off the upper Deck, unto the vulgar one among his Acquaintance, who spoke to him about the People on the brow or side of the mountain."

The bells were evidently ringing for the 5th of November, and I find that the bells of the parish church of Brixham are still rung on that day, but I apprehend the custom has been continued in commemoration of the landing of the Prince.

All who know Brixham, even in its present populous condition, can corroborate the accuracy of Whittle's description of the coast, and recognize his felicitous expression of the people on shore being "on the brow of the mountain."

Whittle proceeds as follows :

"The Prince of Orange being come into the middle of the Bay, called Torbay, attended with three or four Men of War only, that is to say, one or two sailing before his Vessel, and one on each side the Ship in which he was ; and all the Merchant Ships, Pinks and Fly-boats coming round him, as near as they durst for safety, the rest of the Men of War being out in the Rear to secure all the little Pinks and Fly-boats, and withal to prevent the English Fleet from disturbing us in our Landing."

In the first paper referred to by Mr. Pengelly, reference is made to a visit to Tor-Abbey, and Mr. Blewitt in his *Panorama of Torquay*, gives the same account from the *Harleian Miscellany*. It is noteworthy that Whittle also describes it, but in different language, so that it may be taken as an important corroboration of the story. The following is Whittle's account :

"At the upper end of Torbay there is a fair House, belonging to one Mr. Carey, a very rigid Papist, who entertained a Priest in his House. This Priest going to recreate himself on the Leads, on the top thereof, it being a most delightful day, as he was walking there he happened to cast his Eyes towards the Sea, and espying the Fleet at a distance, withal being purblind in his Eyes, as well as blinded by Satan in his Mind, he presently concludes that 'twas the French Navy (because he saw divers White Flags) come to land the Sons of Belial, which should cut off the Children of God, or as they call us, the Hereticks : And being transported with joy, he hastened to inform his own Disciples of the House, and forthwith they sung Te Deum. This was a second grand Mistake, the third time will fall to our Lot to sing Te Deum for our safe Landing, (as the Prince had it done at Exeter Cathedral in the Quire) : And because false Reports were

spread abroad, that the People of this House had shot several of the Prince of Orange's Souldiers, and thereupon they had burnt down the House : I must inform the candid Reader that there was nothing at all in it, for our People did not give them one reviling word, nor they us ; some lodged there while we were at Torbay."

He then proceeds with the following account of the landing :

"The major part of the fleet being come into the Bay, Boats were ordered to carry the Prince on Shore, with his Guards ; and passing towards the Land, with sundry Lords, the Admiral of Rotterdam gave divers Guns at his Landing ; the Boat was held length-ways until he was on shore : So after he had set his Feet on Land, then came all the Lords and Guards, some going before his Sacred Person, and some coming after. There are sundry little Houses which belong unto Fisher-men, between the two Hills, at Torbay where we landed. The People of these Houses came running out at their Doors to see this happy Sight. So the Prince, with Mareschal Schomberg, and divers Lords, Knights, and Gentlemen, marched up the Hill, which all the Fleet could see over the Houses, the Colours flying and flourishing before his Highness, the Trumpets sounding, the Hoit-boys played, the Drums beat, and the Lords, Knights, Gentlemen, and Guards shouted ; and sundry Huzzas did now echo in the Fleet, from off the Hill, insomuch that our very hearts below in the water were even ravished for joy thereof. On this Hill you could see all the Fleet most perfectly, and the Men of War sailing up and down the Seas, to clear them of all Enemies ; the Ships in the Rear making all the sail and speed they could.

"The Navy was like a little City, the Masts appearing like so many Spires. The People were like Bees swarming all over the Bay ; and now all the Schievelingers are set to work to carry the Men and Horses unto Shore with speed, for as yet they had done nothing. The Officers and Souldiers crowded the Boats extreemly, many being ready to sink under the Weight ; happy was that Man which could get to Land soonest : And such was the eagerness of both Officers and Souldiers, that divers jeopardied their Lives for haste. Sundry Oars were broken in rowing, because too many laid hands on them, some jump'd up to their Knees in Water, and one or two were over Head and Ears. Extraordinary pains was now taken by all sorts of Men to get their necessary things to shore, every one minding his own concern. The Night was now as the Day for Labour, and all this was done, lest the Enemy should come before we were all in readiness to receive them. The Country Harmony was, ringing of Bells for our arrival.

"The Officers and Souldiers were continually marching up the Hill after the manner of the Guards, with their Colours flying and flourishing, Hoitboyes playing, Drums beating, and all shouting and echoing forth Huzza's."

Whittle does not give many particulars of the landing of the Prince himself. Probably they did not land at the same time. It is interesting as to this to refer to the details given by Blewitt in the *Panorama*. His account is as follows :

"The 4th of November it anchored safely in Torbay. This was the anniversary of the Prince's birth and marriage, and he therefore wished to render it more memorable by landing on the British shores. The preparations, however, could not be completed that night, but on the following day, the Prince, attended by his principal officers, proceeded to raise his standard on Brixham Quay. At this time Brixham contained but few houses, and the good people, astonished at the appearance of such an armament, are said to have stood in silent wonder on the beach. At last William approached the shore and demanded whether he was welcome, when after some further pause he was asked what was his business, and his explanation being considered satisfactory, he was, after a little more parley, informed that he was welcome. 'If I am, then,' said the Prince, 'come and carry me ashore,' and immediately a little man, one of the party, plunged into the water and carried him triumphantly ashore to the steps of the pier. On his landing the inhabitants are said to have presented their illustrious visitor with the following address :

"'And, please your Majesty King William,
You're welcome to Brixham Quay
To eat buckhorn and drink bohea,
Along with we,
And please your Majesty King William.'"

This story Mr. White very properly calls an absurd one, as the Prince was not a King, and tea was a fabulous price.

In a note to this account, said to have been communicated by the Rev. H. F. Lyte, it is stated as follows :

"The subsequent history of the 'little man' who carried the King on shore is rather singular. Having a short ambling pony, which was commonly used in fish-jolting, he rode bare-headed before the Prince to Newton and afterwards to Exeter, and so pleased him by his zeal, that he told him to come to him to court, when he should be seated on the throne, and he would make a great man of him. He also gave him a line under his hand, which was to be his passport into the royal presence. In due time accordingly the little man took his course to London, promising his townsmen that he should come back among them a Lord at least. When, however, he arrived there some sharpers, who learnt his errand at the Inn where he put up, made our poor little Brixhamite gloriously drunk, and kept him in that state for several successive weeks. During this time one of the party, having obtained the passport, went to Court, with the little man's tale in his mouth, and received a handsome present from the King. Our adventurer, recovering

himself shortly afterward, went to the Palace without his card of admission and was repulsed as an impostor, and came back to Brixham never to hold up his head again."

I find that this story of the little fisherman carrying the Prince on shore is still current at Brixham, the reason given for it being that it was low tide at the time; the ending of the story as given to me being that the "little man" who journeyed to London to see the Prince, owing to being in difficulties from having lost his horse, and his boat being out of repair, *did* see the King, and received a large sum of money, said to be £100, with which he built a house in Brixham, and lived "happily for ever after."

His name was Varwell,* and one story is, that the Prince, on being carried safely on shore, desired him to ask a favour of him, upon which the fisherman desired that no press-gang might be sent to Brixham.

The actual spot on which the Prince landed was where the fish market now stands, and the stone on which the Prince first placed his foot was long preserved there, and pointed out with pride and veneration. In 1828, William IV., then Duke of Clarence, having come into Torbay, landed at the New Quay at Brixham, and this stone was removed from the fish market to this place to have the additional honour of receiving the second Prince of that name who had dignified Brixham by his presence; and while the Duke stood on the stone the Rev. H. F. Lyte, on the part of the inhabitants, presented him with a box of heart of oak 800 years old, a portion of the timber of the old Totnes bridge, lined with velvet, containing a small portion of the stone, which the Duke in his reply promised to preserve as a precious relic.

The stone itself was built into a small granite column erected to commemorate the landing of the two Princes, and was set up in the fish market; but in consequence of its inconvenient situation it was taken down, and subsequently erected on the Victoria Pier.

Blewitt remarks that the landing of the Prince on the shoulders of the little fisherman was a very different kind of landing to that which Northcote has assigned to William in his celebrated picture. An old Dutch print, at present in my possession, purporting to be a delineation of the landing, represents on the land a large and imposing castle, into

* Mr. Peter Varwell, of Exeter, the representative of an old Brixham family, says that it has always been handed down in his family as a positive fact that one of his ancestors assisted the Prince to land, and gave him his first night's lodging in his humble abode in Middle Street.

which the troops as they land are triumphantly marching, the Prince's flag flying from the summit!

To return to Whittle's narrative, we find him giving the following account of the proceedings subsequent to the landing:

"As soon as the Prince had viewed well the Ground upon the top of the Hill, and found the most commodious place for all his Army to encamp, he then gave Orders for everything, and so returned down the Hill unto the Fishermen's little Houses: One of which he made his Palace at that time, instead of those at Loo, Houterdyke, and the Hague: The Horse Guards and some Foot were round about him at other Houses, and a strong Guard but a little below the House wherein his Highness was: All the Lords were quartered up and down at these Fishermen's Houses, whereof these poor Men were glad: Now the Camp began to be filled with Officers and Souldiers; for no Officer must move from his Company or Post. The Foot Guards belonging to the Prince of Orange did encamp within an enclosure of plowed Land, about which there was a natural Fence, good Hedges and little Stone Walls, so that no Horse could touch them; Count Solms being their Colonel or Commander. Count Nassau's Regiment encamp'd in another Craft or Inclosure joyning to that of the Guards, having the like Fence about it as before: The Regiment belonging unto Colonel Fagell encamp'd in a Craft or Inclosure next to that of Count Nassau, and so all the English, Dutch, French, and Scots encamp'd according to the aforesaid manner. The Souldiers were marching into the Camp all hours in the Night; and if any straggled from their Companies, it was no easy matter to find them in the dark amongst so many thousands; so that continually some or other were lost and enquiring after their Regiments.

"It was a cold frosty night, and the stars twinkl'd exceedingly; besides, the Ground was very wet after so much Rain and ill Weather; the Souldiers were to stand to their Arms the whole Night, at least to be all in a readiness if anything should happen, or the enemy make an Assault; and therefore sundry Souldiers went to fetch some old Hedges and cut down green Wood to burn therewith, to make some Fire. Now one Regiment beginning all the rest soon followed their Example. Those that had Provision in their Snap-sacks (as most of the Souldiers had) did broil it at the Fire, and others went into the villages thereabouts to buy some fresh Provisions for their Officers, being we were newly come from Sea; but alas! here was little Provision to be gotten. There was a little Ale house amongst the Fishermen's Houses which was so extremely throng'd and crowded that a Man could not thrust in his Head, nor get Bread or Ale for Money. It was a happy time for the Landlord, who strutted about as if indeed he had been a Lord himself, because he was honoured with Lords Company."

The little "ale-house" was probably the Buller's Arms, which is still in existence. Report says that the Prince himself slept there, though this is doubtful, and that he left behind him there, or where he slept, a ring, which fell into the possession of the landlord, and was preserved with great care by subsequent possessors, eventually coming into the possession of one Mary Churchward, who died somewhere about twenty years ago, from whom the ring was stolen some years before her death by a thief who entered her bedroom at night, and carried it off, owing to the lady being in the habit of sleeping with her window open. Persons now, in Brixham remember the lady bitterly lamenting the loss of the ring on account of its having belonged to the Prince of Orange.

Whittle continues :

"On the morrow after we landed, when all the Souldiers were encamp'd, the Prince with sundry Noblemen rode and viewed each Regiment, and then return'd to Dinner at this little House. The Number of his Highness's Regiments landed here at this Bay was about six and twenty, the number of Officers about one thousand, the number of Field Officers about seventy-eight : The number of all his Forces and Souldiers about fifteen thousand four hundred and odd men. You might have seen several hundred Fires all at once in this Encampment, which must needs signify to the Country round about that we were landed. The Prince here was pleased to accept of Peoples Good-Will for the Deed, because things were not here to be bought for Mony, no Market-Town being near. Many People from all the adjacent places came flocking to see the Prince of Orange. The Horses were landed with all the speed that might be, and truly were much out of order, and sorely bruised, not able to find their Legs for some days : Everything that was of present use was posted to shoar, but the Artillery, Magazine, and all sorts of Baggage and cumbersom things were left on Shipboard, and order'd to meet us at Exeter."

Whittle's reference to the fact that many people from the adjacent places came flocking to see the Prince is confirmed by other writers. Local tradition in my own family, handed down from parent to child with no little pride, says, that among those who flocked to see the Prince from here were two Windeatts, Samuel and Thomas, father and son, and a lady whose great niece subsequently intermarried with the Windeatts. At the time of the Prince's landing, Samuel Windeatt, a man about forty, and a strict Nonconformist, was living in Bridgetown, where the family had been settled for some years. Hearing the joyful news that the Protestant Prince of

Orange was in Torbay, he immediately set off to "Broxholme" on horseback, taking his little son Thomas, then about eight years old, in front of him, to see the Deliverer of England and his troops. They narrated the fact on their return, that the country people around brought quantities of apples, and rolled them down the hill to the soldiers; and the truth of this incident was curiously confirmed some years since. A member of my family having mentioned this to a gentleman who in his early days farmed in this part of the country, he gave me the following interesting account of the stories handed down to him :

"There are few now left who can say as I can that they have heard their father and their wife's father talking together of the men who saw the landing of William the Third at Torbay. I have heard Capt. Clements say he as a boy heard as many as seven or eight old men each giving the particulars of what he saw then. One said a ship load of horses hauled up to the Quay and the horses walked out all harnessed, and the quickness with which each man knew his horse and mounted it surprised them. Another old man said, 'I helped to get on shore the horses that were thrown overboard and swam on shore, guided by only a single rope running from the ship to the shore;' and another would describe the difference in the rigging and build of the ships, but all appeared to welcome them as friends.

"My father remembered only one 'Gaffer Will Webber,' of Staverton, who served his apprenticeship with one of his ancestors, and who lived to a great age, say, that he went from Staverton as a boy, with his father, who took a cart-load of apples from Staverton to the high-road from Brixham to Exeter, that the soldiers might help themselves to them, and to wish them 'God-speed.'

"I merely mention this to show how easily *tradition* can be handed down, requiring only three or four individuals, for two centuries."

The lady I referred to as one of those who flocked to see the Prince was a Miss Juliana Babbage, from a brother of whom the late Charles Babbage, the famous mathematician, was descended. She came, when a girl of twelve, from Barbadoes, and was also a decided Nonconformist. On the 5th November, 1688, she was attending the old meeting-house in Totnes, at a thanksgiving service for the discovery of the gunpowder plot, and while there was told that the Prince of Orange was in Torbay landing his troops. She also hailed the news with joy, and as soon as service was over set off to walk to Brixham, accompanied by an

old lady of her acquaintance, and making their way to the Prince, they boldly welcomed him to England. He shook hands with them, and gave them some of his proclamations to distribute, which they did so industriously that not one was left in the family as a memorial. A crimson velvet and gold purse, a pincushion, and a gold chain, which she is said to have worn on the occasion, as well as a curious gold locket with hair belonging to her, are still in the possession of our family.

These stories come to me from a relative who has attained an honoured old age, who, owing to the early death of her mother, passed her childhood and girlhood in an old family circle, and heard from the lips of those elderly relatives tales of old times, which they had received in like manner from their relatives. This lady says her grandmother told her she well recollected her father, joking her mother as to what might have happened if the Prince had not succeeded, saying, "Oh, mistress, your aunt might have swung for it!"

The terror infused into the minds of the men of the West, by the bitter persecution which followed the unsuccessful rising on behalf of the Duke of Monmouth, was doubtless sufficient to deter the leading men from openly espousing the Prince's cause at this moment.

The first gentleman of any position to do so, and this he probably did at Brixham, as he lived in the neighbourhood, was Mr. Nicholas Roope, who was appropriately rewarded for his adhesion to the Prince by being appointed within a short time of the Prince reaching St. James', Governor of Dartmouth Castle, in the room of Sir Edward Seymour the elder, who had then recently died.

In an interesting letter from the last Governor of Dartmouth Castle (Governor Holdsworth) to Sir H. P. Seale, Bart., dated May 1st, 1857, the warrant for his appointment is set out in full. It runs in the name of William Henry Prince of Orange, and is dated 7th of January, 1683, and this was followed, on the 18th July of the same year (1689), by a regular commission, when the Prince had become King of England.

The authority for the statement that Mr. Roope was the first to join the King is contained in a letter from Mr. Roope to the Earl of Nottingham, in reply to one from his Lordship containing a complaint against him. These letters are set out in full in Governor Holdsworth's letter, and are as follows:

"Whitehall, May 24th, 1692.

"SIR,—Complaint having been made to the Queen that you stopped an advice Boat which was going to the Fleet to give notice of the French being under Saile, and of the place where they were, her Majesty would have you forthwith give an account how the matter of fact was, and what was the reason of your doing it.

"I am, your humble Servant,

"NOTTINGHAM.

"To Mr. Nicholas Roope."

"May ye 27th, 1692.

SIR,—Yours of the 24th I received As to the stopping y^e Catch, I wrote my reasons for it presently to my Lord Cornwallis, Humbly desiring him, as the Privy Counsellor, to acquaint her Majesty with it (which I hope is done). I had that day sent two expresses from Dartmouth of the French fleet coming up Channel to the Lords of the Admiralty and Governor of Portsmouth. Seeing a vessel under sail between y^e Castles severall hours after these were gone, I commanded the Master on shore who told me he was going out from Mr. Bowers. The Enemy's fleet before y^e harbour, Their good ships (I saw some myself) as high almost as Portland. I thought I could not justify the passing a ship or boat at such a time, for it was to me impossible, but she must be taken; besides this Mr. Bowers had been a faithful servant to King James, and Sir John Southcot was Collector there, and made an Alderman of this place to serve a turn, he might as well send to make his peace, as send for our good. Though I was in Town, I was not made acquainted with what was done, *though I was the first gentleman who went into the King*, and I have served him faithfully since, and shall do, God willing. My Lord, I hope these reasons, with what I sent to my Lord Cornwallis, will satisfy her Majesty and your Lordship. If not (as soon as I have done some service I was ordered to do for their Majesties), you shall be waited on by, Sir,

Your Honour's humble, obedient Servant,

"NICHOLAS ROOPE.

"To the Right Honorable

"The Earle of Nottingham,

"Their Maj^{ties} Secretary of State."

At Berry Pomeroy, some few miles distant from the scene of the Prince's landing, was then living Sir Edward Seymour the younger, sometime Speaker of the House of Commons, son of the Seymour who was Roope's predecessor in the governorship of Dartmouth Castle, and one of the most influential men of his time; whose birth, says Macaulay, put him on a level with the noblest subjects in Europe, and who in political influence and in Parliamentary abilities was

beyond comparison the foremost among the Tory gentlemen of England. He openly joined the Prince at Exeter; and he it was who contributed greatly to the success of the Prince's cause by suggesting that an association should be founded, and that all the English adherents of the Prince should put their hands to an instrument binding them to be true to their leader and to each other. He doubtless was well informed of what was now going on at Brixham, and we can hardly imagine him to have been a passive spectator of the great enterprise. Tradition says that the Prince had a secret interview with him at a house, now a cluster of labourers' cottages, still known as Parliament House, situate on the confines of Berry parish, on the road from Berry House to Brixham, and that there he agreed to come out for the Prince at Exeter, for which city he was member. Another account gives the place of meeting at Marldon, at a spot now called Parliament Hill. The present Duke of Somerset, with whom I have communicated on this point, has been good enough to inform me that he believes the building called Parliament House to have been the place where the country gentlemen assembled and agreed to support the Prince, and that the latter probably had some interview with Seymour at that time, as it was by his inducement that the country gentlemen when they met at Exeter signed their names to the paper I have before referred to, promising to support the Prince, and that for this probably the Prince appointed him Governor of Exeter.

His Grace also informs me that the late Duke, who had the family papers examined, said that all documents relating to these transactions appeared to have been carefully destroyed, and that this precaution was natural after the recent failure of Monmouth's landing in the West of England, though it deprives us, as he says, of many incidents that would now be very interesting.

There is little information to be gained from the parish records of Brixham on the subject of this paper; but from them it appears that at least one poor nameless foreigner was left behind at Brixham when the Prince's army began its march to Exeter, and probably succumbed to the effects of the voyage, which, from Whittle's narrative, appears to have been fatal to 500 horses; for in the Register of Burials for the parish for the year 1688 there appears the following entry :

"Nov. 21, a floreigner belonging to the Pronz of Oringe."

In another book, containing an account of those buried in woollen, in accordance with the law passed to encourage that trade, the entry is as follows :

“ November 21, a Dutchman *cujus nomen ignotum.*”

There is a steep lane leading from the outer harbour up the hill to where the station now stands, which the present vicar of Brixham considers derives its name, Overgang, apparently a Dutch word, from “ Obergang,” or Gang-ober or “ over,” and that it arose from the fact of troops after the landing being repeatedly ordered to gang over this hill. This may be so ; but as I find that the word “ gang,” meaning to go or to walk, was in use in England in the time of Spenser, it is not improbable that this lane gained its name before the advent of the Prince of Orange.

The Prince's army marched from Brixham on its way to Newton on the 6th or 7th November, passing along the narrow lanes of Churston, Paignton, Cockington, and Kingskerswell, taking apparently a part of two days on the march, the roads being so bad as to make locomotion slow and tedious.

Report says that at a place called Collins' Grave, near the higher lodge at Churston, where there is high ground overlooking the river, the army encamped one night ; also that the Prince himself stayed at a house in Paignton, now the Crown and Anchor Inn. A room there is still shown as the “ Prince's room.”

In a Protestant sense it is interesting that William landed within sight of the Bible Tower at Paignton, where Coverdale, the translator of the Bible, undoubtedly dwelt, and where he is said to have been probably engaged on his translation ; and doubtless this tradition was not lost sight of by those about the Prince on his sleeping at the Crown and Anchor, just outside the palace wall.

The following is Whittle's graphic account of the march to Newton :

“ Upon Wednesday about Noon, Order was given to march towards Exeter, and so every Souldier was commanded by their Officers to carry something or other besides his own Arms and Snap-sack, and this made many murmur exceedingly. Sundry scores of Horses were thrown overboard which died at Sea, so that by just Computation the Prince lost about six hundred Horse at least by the Storm. As we marched here upon good ground, the Souldiers would stumble and sometimes fall, because of a dissiness in their Heads after they had been so long toss'd at Sea, the very

ground seem'd to rowl up and down for some days, according to the manner of the Waves : Therefore, it was the Lord's Goodness that our Foes did not come upon us in this juncture and unfit Condition. The whole Army marched all the same way, in a manner which made very ill for the Rear Regiments, and cast them much behind. Many Country People which met us did not know what to say or think, being afraid that we should be served as the D. of Monmouth's handful of Men were. Notwithstanding, some were so courageous as to speak out and say, truly their Hearts were for us, and went along with us, and pray'd for the Prince of Orange ; but they said the Irish would come and cut them in pieces if it should be known. Some Souldiers asked them if they would go with them against the Popists ? and many answered they were enough themselves, and wanted no more. His Highness, with Mareschal Scomberg, Count Solms, Count Nassau, Heer Benting, Heer Zulustein, Earl of Shrewsbury, Earl of Macclesfield, Viscount Mordaunt, Lord Wiltshire, and divers other Knights and Gentlemen, came in the Rear of the middle Line ; for as soon as we could conveniently, we were to march in three Lines, and the Prince was commonly or always in the middlemost Line, which was the meetest place : So he went unto a certain Gentleman's House, about two little miles off, where the last Line encamp'd the Second Night, and lodged there, his own Guards being with him. This first day we marched some hours after Night in the Dark and Rain ; the lanes hereabout were very narrow, and not used to Wagons, Carts or Coaches, and therefore extream rough and stony, which hindred us very much from making any speed. Divers of the Dutchmen being unaccustomed to such bad ways and hard marching in the Dirt, wished themselves back again in their own Country, and murmured because of the Dark and Rain. At length we came to the Corn-stubble Inclosures on the side of a Hill, where we encamp'd that Night. It was a red clay, and it rain'd very hard the greatest part of the Night ; the Winds being high and stormy. Nevertheless, the poor Souldiers being much wearied with the Tent-Polls, Spare Arms, and other Utensils for War, which they had carried all Day and some hours after Night, as well as with the badness of the March, lay down to take their Repose ; and verily the water run over and under some of their legs the major part of the Night, and their Heads, Backs and Arms sunck deep into the Clay, being so very wet and soft, notwithstanding, they slept all Night very sweetly, in their Pee or Campagne Coats. The Souldiers here fetch'd some old Hedges and Gates to make their Officers and themselves some Fire (as they had done the night before), else some would have perished in the Cold, being all over in a Froth with Sweat in marching. And the old Hedges and Gates not being enough, they fetch'd away the new ones, for the Weather was not only raw and cold but we ourselves were so too, having nothing to eat or drink after so bad a day's journey. The Souldiers had some good Holland's Beef in their Snap-sacks, which

they brought, and their Officers were very glad to get part with them, so they broil'd it at the Fire; some had bought Chickens by the way, but raw, which they broil'd and eat as a most delicate Dish. Sundry Captains offer'd any Mony for a Guide to bring them to a House thereabout, where they might have some provision for their money, but no Guide could be found; it was exceeding dark, and being all Strangers and unacquainted with the Country, we could not tell where to find one House, for those few that were scattering here and there were either in some little grove of Trees, and so hid from our Eyes, or else in a bottom amongst the Hills, and so could not be seen. These Quarters did not content our Minds, for tho' we got as near to the Hedges as we could possible with our Fires, yet we could not be warm. Many of the Souldiers slept with their Feet in the Ditch, and their Heads on the side thereof. We thought this Night almost as long as that in the Storm at Sea; and judg'd it to be the dawn of the Day some hours before it was. The Morning appearing rejoiced our very Hearts, for we thought now we should march presently; and we were sure of this, that worse Quarters we could never meet with, but much better we hoped to find. A private souldier, therefore, going in the next Croft for to seek a convenient place, he found it to be an Inclosure with Turnips, so bringing his Burden away with him, he came to the Fire and gave those there some, telling his Comrades of the Place, who soon hastened thereto, and brought enow with them: Some roasted them and others eat them raw, and made a brave Banquet. The Souldiers were busy in discharging their Musquets, after the Wet and Rain, for they durst not trust to that Charge; and about 11 of the Clock the Army received Orders to march.

"The Prince of Orange with the Lords and Gentlemen, rode from this place unto Sir William Courtenay's, within a mile of Newton Abbot, the first Line being about Newton, and the last on their march thither. The Place where we encamped was trodden to Dirt, and stuck to our Shoes wretchedly. Now the Regiments marched sundry Roads, of which we were right glad, hoping to meet with better Quarters than the Marl and Clay Crofts. The People came in flocks unto the Cross-ways to see the Army, but especially the Prince. We met with much civility on the Road; now they began to give us Applause, and pray for our Success; sundry Persons enquired for the Declaration of his Highness."

In the *Seventh Report of the Historical Manuscripts Commission for 1879*, part ii., there is a long letter written in French relating to the expedition of the Prince of Orange, from the Earl of Denbigh's collection of MSS. It has no signature, and is entitled, "*Relation du Voyage d'Angleterre.*"

The following is a translation of a portion relating to the journey to Newton. It seems to accord well with Whittle's narrative, and confirms the story of the visit to Paignton.

"On the morning of the 14th (o.s) of November, we discovered the Isle of Wight, and towards evening Portland Bill, when His Highness detached two frigates and three ships carrying infantry towards Dartmouth, in order to secure the entrance to that port by possessing the two castles at the harbour's mouth. But some time afterwards, when we had almost reached Dartmouth, the wind suddenly changed to the west, and to such an extent that it was almost impossible to get in, and we were obliged to retrace our course in the direction of Torbay, where we arrived with the whole fleet in very good order at three o'clock in the afternoon. His Highness at once gave the signal to disembark, which was done without any resistance; and so quickly was this accomplished, that the whole of the Infantry were landed before midnight. The landing of the Cavalry, however, gave us a little more trouble; for we were obliged to lower the horses into the sea, and make them swim to shore, and no less than two days were thus occupied. With regard to the artillery, ammunition, and baggage, we were obliged to leave them in the ships, and thus despatch them to Exeter, as there was not only a great difficulty in procuring the requisite number of vehicles, but the character of the country, which was full of mountains and rocks, precluded us from sending them by land.

"On the 15th we marched to Paignton, a village situated on the other side of the Bay, where our troops encamped. On the morrow we proceeded to Newton Bushel, where we were joined by the cavalry, which had taken one day more to disembark.

"On the 18th we went from Newton to Chudleigh, the whole of the army being quartered in the villages of the neighbourhood. On the 18th His Highness, accompanied by his body-guard, five battalions of infantry and two regiments of dragoons, resumed his journey to Exeter, leaving his cavalry stationed in the villages between Newton and Exeter."

Arrived near Newton, the Prince, as Whittle says, went to Ford House, within a short distance of the town, the residence of Sir William Courtenay, who endeavoured cautiously to abstain from doing anything to compromise himself with the King, should the latter prevail, and so managed not to be at home on the Prince's arrival, but left directions that he should be hospitably lodged and feasted. Here he probably stayed two nights to enable the whole of the troops to come up and be in order for the march to Exeter, to which place Dr. Burnet and Lord Mordaunt with four troops of horse were sent on in advance. The room at Ford House in which the Prince slept is still pointed out; it is always called the "Orange room," and is papered and upholstered in orange.

Mr. Blewitt, in the *Panorama of Torquay*, says: "It is said

that his first proclamation was read from the base of the ancient cross at Newton by the Rev. John Reynell, the minister of Wolborough ;” and Mr. White, in his valuable *History of Torquay*, published in 1878, repeats this statement as a fact. The stone pedestal, on which formerly stood the ancient cross, still remains near the tower at Newton, in the parish of Wolborough, and is now surmounted by a public lamp. On this pedestal is the following inscription :

THE FIRST DECLARATION OF
WILLIAM III., PRINCE OF ORANGE,
THE GLORIOUS DEFENDER OF THE
LIBERTIES OF ENGLAND,
WAS READ ON THIS PEDESTAL BY
THE REV. JOHN REYNELL,
RECTOR OF THIS PARISH,
5TH NOVEMBER,
1688.

That the Prince’s declaration was read from the old cross there can be little doubt, but that the inscription cannot be looked upon as much of an authority is clear from the statement that the declaration was read on the 5th ; for the Prince’s army did not commence to land at Brixham until that day, and could not possibly have reached Newton until the 7th ; and that it is erroneous also in stating that it was read by Reynell is evident from the following very interesting paragraph from Whittle’s *Diary* :

“Now being on their march to Newton Abbot, a certain Divine went before the Army ; and finding that ’twas their Market-day, he went unto the Cross, or Town Hall ; where, pulling out the Declaration of the Prince of Orange, with undaunted Resolution, he began, with a loud and audible voice, to read as follows : William Henry, by the Grace of God, Prince of Orange, &c., of the Reasons inducing him to appear in Arms in the Kingdom of England, for preserving of the Protestant Religion, and restoring the Laws and Liberties of England, Scotland, and Ireland, &c. When the people heard the Prince of Orange’s name mentioned, they immediately crowded about him in a prodigious manner to hear him, insomuch that some jeopardied their lives.

“The Declaration being ended, he said, God bless and preserve the Prince of Orange : To which the People, with one Heart and Voice, answered Amen, Amen ; and forthwith shouted for Joy, and made the Town ring with their echoing Huzza’s. The Minister, nolens volens, was carried into a Chamber near the Place : the

Windows were shut, the Doors lock'd and bolted, to prevent the Crowd from rushing in.

"The People of the House, and others very kindly asked him ; Sir, What will you be pleased to eat? or, What shall we provide for you? Name what you love best, it shall be had. The Minister answered, What you please, give me what you will. So they brought forth such as was ready; and having eaten and drunk well, they desired him to spare them but one Declaration. Yes, says he, for I have enow in my Pocket; and pulling them out, he gave Three, because they were of distinct Parishes. He told the People, he would go and visit their Minister, and cause their Bells to ring, because the Prince of Orange was come into the Parish, at Sir Will Courtney's, tho' not into the Town; and (says he) this being the first Market-Town, I cannot but think it much the more proper and expedient. Whereupon he went to the Minister's House, and enquiring for him he was courteously invited in, and desired to sit down: The Reverend Minister of the Parish coming presently to him, they saluted each other; and after some Communications passed between them, this Divine from the Army, desired the Keys of his Church Doors, for to welcome the Prince of Orange into England with a Peal (that being the first Market-Town they came to). The Minister answered; Sir, for my own part, I am ready to serve his Highness any way, but of my own accord cannot give the Keys; but you know you may command them, or anything else in my House in the Name of the Prince of Orange, and then I will readily grant it. So the Divine said; Sir, I demand your Keys of the Church Door only for an hour to give his Highness a Peal, and then I will return them safely unto you.

"The Minister presently directed him to the Clerk's house, and desired him to come and take a Glass of Wine with him after the Peal was ended, (but the Ringers coming together, they rung sundry Peals) and he returned the Keys to the Minister.

"The People of the Town were exceeding Joyful, and began to drink the Prince of Orange's Health. The Country People in the Town were well inclined towards us; and here was the first favour we met with worth mentioning. His Highness was most kindly receiv'd and entertain'd at Sir Will Courtney's, the Souldiers generally well treated by the Vulgar."

Oldmixon, in his *History of the Reign of the Stuarts*, simply says that "the first place the Prince of Orange's Declaration was publicly read was Newton Abbot, a market town near Exeter, and the first man who read it was a clergyman." No doubt the fact that it was read by a clergyman gradually changed into the statement that it was read by *the* clergyman of the parish, and so Reynell became credited with a bold act, which from Whittle's account he was far too cautious a man

to commit, however favourable he may have been to the Prince's cause. The lettering of the inscription is evidently modern; and the Rev. H. Tudor, the present Rector of Wolborough, informs me that a man, now dead, told him he was employed to cut or re-cut it, and was never paid for doing so.

The question remains, and it is an interesting one, Who was the divine who first proclaimed the Prince by reading the Declaration? I was first inclined to believe, from the detailed manner in which the story was told, that it was Whittle himself. It is not improbable, however, that it was the renowned Dr. Burnet, afterwards Bishop Burnet. He was the Prince's own chaplain, and doubtless the head and chief of the clergy who accompanied the Prince, and from his undaunted spirit, and the leading part he took in the Cathedral at Exeter, he was undoubtedly the divine most likely to have performed this act. One gentleman with whom I have been in communication on the point, and whose opinion always carries weight, says: "Burnet was such a busybody that I feel certain if anything was to be done by a clergyman he would have put himself forward to do it."

No information is to be gleaned from the parish registers or the books I have inspected relative to what occurred at Newton during the time of the Prince's visit, but I have been favoured with the following interesting story from a lady now residing at Newton, of the advanced age of ninety-six, told her by her father, who heard it from his grandmother, who was a Miss Joan Bearne, the daughter of Mr. Bearne, a lawyer of Newton Abbot; viz., that, when a girl of sixteen, there was a stranger staying at her father's house for about three weeks, who was only known as "the gentleman," and who was out during the day, and only returned in the evening; that on the entry of William of Orange into Newton from Ford House her father took her out to see him, and that walking by the side of the Prince was the strange gentleman, who on passing where Mr. Bearne was standing pointed him out as "his host for three weeks" to the Prince, who at once lifted his hat to him.

Having thus accompanied the Prince to Newton, I must now leave him, reserving an account of the visit to Exeter for another occasion.

NOTICE OF A WOODEN EFFIGY FOUND AT DARTMOUTH, 1879.

BY EDWARD APPLETON.

(Read at Totnes, July, 1880.)

IN taking down an old house near St. Saviour's Church, at Dartmouth, in 1879, the subject of this notice was discovered. When *in situ* it had the appearance of an ordinary piece of old timber, and served as a *lintel* of a back window; but upon removal, the portion of the slab which had been covered by the walling was found to be sculptured.

The effigy evidently represents an *Ecclesiastic*, who, doubtless, in his day, was "a *Pillar of the Church*," though subsequently, alas! his monument became a support of a common house, and formed the head of a window which looked out into a tavern yard (the *Bishop* had become part of a *beer-shop*). "To what base uses do we come!"

In calling attention to this relic of bygone days, I wish to incite discussion upon what it was, and who it was intended to represent, rather than to express my own opinions; but, in order to place "*the find*" upon record, I have noted the following particulars:

The slab is now about five feet two inches in length; but allowing for what has gone, through decay, was probably some few inches longer; the present breadth is one foot, but the sides appear to have been cut; the figure was, therefore, nearly life-size. There are two iron-eyes or loops screwed into the back, and two large nails *driven in from* the front; but whether the former are *ancient*, is doubtful; the *latter*, I think, *are*, as the front (or sculptured part of the figure) was *uppermost* in the wall, and buried in the masonry; the *nails*, therefore, could not have been placed there for any ultra purpose, and their positions are exactly alike; viz., at the points of the shoulders *outside* the vestment. The wood appears to

be *chestnut*, and it is well known that this timber was largely used in buildings of the Middle Ages.

I am inclined to think the effigy was placed in a recumbent position, though it may have been upright against a wall; there is no sign now of any carved work at the back.

The figure is *mitred*, and has the *alb*, *cope*, and *stole*, the latter fringed, the fringe apparently having been *gilded*; the *alb* seems to have been fastened in front with a brooch. The face and neck are tinted flesh-colour; the *alb* is painted white; and there are traces of blue, yellow, black, and red in portions of the dress and mitre. The arms, hands, and feet are gone; the probable position of the hands was in the attitude of prayer, as frequently seen in recumbent monuments; the left knee is slightly elevated. The apex of the mitre appears to have been burnt. The date ascribed to the house is 1680; but doubtless the figure is much older, and was placed in its late position long after its removal from its original locality.

I am not learned in vestments, but probably experts may be able to decide who the effigy represents, what office the original held, and the date of the work, by the form and ornamentation of the mitre and details of the dress.

The effigy is the property of Mr. Robert Cranford, of Dartmouth, to whose courtesy I am indebted for examination of the figure and permission to delineate it.*

* In the discussion which followed the reading of the above paper Mr. Appleton stated that he had reason to believe the figure probably dated from the end of the fifteenth century.

WERE THERE DRUIDS IN DEVON?

BY R. N. WORTH, F.G.S.

(Read at Totnes, July, 1880.)

THE works of several of our local historians and antiquaries refer to the existence of Druids and the supposed Druidic cultus in Devon as an established fact, and with no little detail and precision give us a full account of the Druidic character and polity. By no writer is the belief in Druids and Druidism in the West so fully set forth as by Polwhele, though later authors have gone further than he did in their assignment to a Druidic origin of our more obscure antiquities, notably the rude stone monuments connected with Dartmoor. If a pile of granite rocks afforded a comfortable seat, canopied by a projecting slab, in their eyes it was a throne of the Arch Druid, or at the very least a seat of judgment. Hollows weathered in the granite, no matter how inaccessible the eminence, became rock basins in which the Druids caught the pure rain-water for their lustrations; rocking-stones formed by the hand of nature were transformed into ordeals reared by the craft of man; the more grotesque granite pinnacles were rock idols,

“To whom in days long flown the suppliant knee
In trembling homage bowed;”

the burial cromlech became the sacrificial altar; the stone circle, the temple or the justice court, in which, to quote the words of Dr. Borlase, “whilst any election or decree was pending, or any solemn compact to be confirmed, the principal persons concerned stood each by his pillar, and where a middle stone was erected in the circle there stood the prince or general elect.”

I propose to enquire what is the value of this speculation. We naturally, in the first place, ask if there is any con-

temporary evidence for the existence of this mystic priesthood, and if so, whether we can connect it with our own county. With the conclusions of the antiquaries of the last century and their followers we have nothing to do, if they cannot be sustained by citations from contemporary, or approximately contemporary, authors, or by deductions from the wide field of archæology.

Now there are only five or six contemporary writers by whom the Druids are mentioned—Cæsar, in his *Commentaries*, circa 50 B.C.; the elder Pliny, in his *Historia Mundi*, about a century later; Tacitus, in his *Annals*, and *Life of Agricola*, later still; Cicero, a passing reference; Suetonius; and Lucan.

Cæsar, in the sixth book of his *Commentaries*, states that the Druids were honoured all over Gaul, and describes them in the following terms:

“The Druids are present at all divine offices, look after the sacrifices, public and private, and interpret the mysteries of religion. The youth in great numbers apply themselves to these Druids for education, and all persons have a great reverence for them; for generally in all controversies, as well public as private, it is they that make the determination. And whenever there is any outrage or murder committed, when any suits rise about estates, or disputes about bounds, all is left to their judgment; they *appoint* rewards or punishments at their discretion. If any, either private person or body of people, abide not by their decree, they forbid him the sacrifices. This among them is esteemed the most grievous of all punishments. They who are thus interdicted are reckoned the most profligate of mankind. All men studiously decline their company and conversation, and shun their approach as if they feared some infection. They are excluded from the benefit of the law, can sue no man, and are incapable of all honours. Amongst all these Druids there is one chief, who hath the supreme authority. Upon his death his successor is some one of the most distinguished merit among them, if there be any such; but if there be several of equal worth and merit, one succeeds by the election of the Druids. Sometimes the sword decides which party shall carry it. These Druids, at a set time every year, have a general assembly in the territory of the Carnutes, which is supposed to lie about the midst of Gaul, in a certain place consecrated to that purpose. Hither resort from all parts such as have any controversies depending, and they are wholly determined by the Druids. This sort of religious profession is thought to have been first in Britain, and from

thence carried over into Gaul. And even now those that desire thoroughly to be instructed in these mysteries for the most part go over into Britain. The Druids are exempt from all military duties, nor do they pay tribute, like the rest of the people; and as they are excused from serving in wars, so are they also from all other troublesome offices whatsoever. These great privileges are the cause that they have so many disciples; some address themselves to be admitted, others are sent to them by their parents or kindred. Then they make them, as it is said, learn by heart a great number of verses; and thus they continue under discipline for several years, not being allowed by their rules to commit what they are taught to writing, although in most other affairs, both public and private, they make use of the Greek character. This rule they have settled among them, I suppose, for two reasons—first, because they would not have the vulgar made acquainted with their mysterious learning; and next, because they would have their scholars exercise their memories, and not trust to what they have in writing. As we see it often happens, that when men rely too much on that help their diligence in learning, and care in retaining, do equally abate. One of the principal points they teach is the immortality and transmigration of souls; and this doctrine, removing the fear of death, they look upon as most proper to excite them to courage. They also make discourses to their scholars concerning the stars and their motions; concerning the magnitude of the heaven and the earth, the natures of things, and the power and majesty of the immortal gods.”*

Subsequently Cæsar states that—

“The whole nation of the Gauls is extremely addicted to superstition, so that in threatening distempers, or in imminent dangers of war, they make no scruple to sacrifice men, or engage themselves by vow to such sacrifices, in which they make use of the ministry of the Druids; for it is a prevalent notion among them that nothing but the life of man can atone for the life of man, insomuch that they use even public sacrifices of this kind: some prepare huge collossi of wicker twigs, in which they put men alive; and setting fire to them, those within expire amidst the flames.”

The chief reference in Tacitus is almost purely historical, in the strictest sense, as distinct from Cæsar’s descriptive narration.

Paulinus Suetonius [A.D. 61], in the reign of Nero, “resolved to subdue the island of Mona, a place inhabited by a

* CÆSAR, *De Bell. Gall.*, lib. vi.

warlike people, and a common refuge for all the discontented Britons. In order to facilitate his approach to a difficult and deceitful shore, he ordered a number of flat-bottomed boats to be constructed. In these he wafted over the infantry; while the cavalry, partly by fording over the shallows, and partly by swimming their horses, advanced to gain a footing on the island. On the opposite shore stood the Britons, close embodied, and prepared for action. Women were seen rushing through the ranks in wild disorder, their apparel funereal, their hair loose to the wind, in their hands flaming torches, and in their whole appearance resembling the frantic rage of the Furies. The Druids were ranged in order, with hands uplifted, invoking the gods, and pouring forth horrible imprecations. The novelty of the sight struck the Romans with awe and terror. They stood in stupid amazement, as if their limbs were benumbed, riveted to one spot, a mark for the enemy. The exhortations of the general diffused new vigour through the ranks, and the men by mutual reproaches inflamed each other to deeds of valour. They felt the disgrace of yielding to a troop of women, and a band of fanatic priests; they advanced the standards, and rushed on to the attack with impetuous fury. The Britons perished in the flames which they themselves had kindled. The island fell, and a garrison was established to retain it in subjection. The religious groves, dedicated to superstitious and barbarous rites, were levelled to the ground. In these recesses the natives imbrued their altars with the blood of their prisoners, and in the entrails of men explored the will of the gods.*

Tacitus has only two other Druidical references. In the *History*† he states, that on the death of Vitellius, "The Druids, in their wild enthusiasm, sang their oracular songs," predicting the downfall of Rome. In the *Life of Agricola* we read, "You will find in both nations [*i.e.* Gaul and Britain] the same religious rites and the same superstitions."‡

Pliny speaks of the Druids of the Gauls as their men of religion, and as cautious and cunning magicians, and states that they were put down by Tiberius, with all the pack of such "prophets and wizards." His principal reference reads thus :—

"The Druids (so the Gauls call their men of religion) hold

* This passage of Tacitus has been assumed to indicate the extirpation of the Druids, but it does not go that length; and from the fact that the island was subsequently reduced by Agricola, it is evident that Suetonius made no permanent impression. *Annals*, book xiv., sec. xxix., xxx.

† Book iv., sec. liv.

‡ Sec. xi.

nothing more sacred than the mistletoe, and the tree on which it grows, provided it be an oak. Therefore they choose solitary groves, wherein are no trees but oaks; nor do they perform any ceremonies without the branches or leaves of that tree: so that from thence (if we attend to the Greek signification, they may very well be thought to have taken the name of Druidæ. Indeed, whatsoever they find growing to or upon an oak, they take to be sent from heaven, and look upon it as a certain sign, that their God hath made choice of that particular tree for himself. But it is a thing very rare to be met withal; and when it is found they resort to it with great devotion. In these ceremonies they principally observe that the moon be just six days old; with which they begin the computation of their months and years, and of that period which with them is called an age, *i.e.* thirty years complete. And they choose the sixth day, because they reckon the moon is then of a considerable strength, when she is not as yet half-full; and they call it by a name answering to 'all-heal.' The sacrifice and a festival entertainment being prepared under the oak, they bring thither two white bulls, whose horns are then, and not till then, tied. This done, the priest, habited in a white vestment, climbs the tree, and with a golden knife cuts off the mistletoe, which is carefully received in a white woollen cloth by them that attend below. Then they proceed to kill the beasts for sacrifice, and make their prayers to their God, that he would bless this, his own gift, to those to whom they shall dispense it. They have a conceit that a decoction of the mistletoe given to any barren animal will certainly make it fruitful; also that it is a most sovereign antidote against all sorts of poison.*

Pliny has no other Druidic allusion save to the adder-stone, of which more hereafter.

The passage in Cicero † runs: "There are Druids in Gaul, with one of whom I was acquainted, namely, Divitiacus Æduus, who enjoyed the hospitality of your house, and spoke of you with admiration. This man not only professed an intimate knowledge of the system of nature, which the Greeks call physiology, but also foretold future events, partly by augury and partly by conjecture."

This is all the direct contemporary evidence upon Druids and Druidism, beyond a statement by Suetonius, in his life of Claudius, that this emperor extinguished the Druidic faith

* PLINY, book xvi., sec. xlv.

† *De Divinatione*, as translated by Davies, *Mythology and Rites of the British Druids*, p. 44.

among the Gauls,—an assertion which has to be taken with at least some qualification; and Lucan's verses following Cæsar.

I have set these citations forth in full for two reasons. First, to show that contemporary writers do not connect what they called Druidism with any part of Britain in particular, except the north of Wales. Secondly, to point out that contemporary authorities fail to present to us any clear, well-defined picture of what a Druid was; and, as I think I shall be able to show, afford no foundation whatever for the Druid of modern belief.

We take Cæsar first, as the leading authority. I do not think his account entitled to more weight than would attach at the present day to a description of the religion of a semi-barbarous people, who made its profession a mystery, and information concerning whose creed and ritual had been gathered on hearsay by an invading foe. It is not possible, on Cæsar's own showing, that he could have been fully informed. Moreover, he goes too far. We cannot believe that the Druids habitually employed the Greek character. If they did, why are there no such inscriptions left, when we still have Ogham writings, and many a Keltic inscription in Roman letters? If the Druids ever used the Greek character, it must have been in the same way as the Romanized Kelt and Teuton borrowed the alphabet of their conquerors. Cæsar elsewhere, too, speaks of the gods of the Romans as being worshipped by the Gauls. Either this must have arisen from Gaulic association with Rome, or from an identity of characteristics between the deities of the two peoples. Indeed, Cæsar says * "The Gauls fancy themselves to be descended from the god Pluto, which, it seems, is the established tradition among the Druids." But if there was this similarity or identity of faith between the Gaul and the Roman, what becomes of the distinctive characters which made Druidism a religion *sui generis*? So also we must accept the idea, if at all, with considerable qualification, that the Druids formed a kind of wide-spread corporation (extending its influence into Britain) over the whole of Gaul, with an annual assembly and a single head—a notion expanded by other writers, without the shadow of evidence, into the existence in Britain of two primacies, the Druidic Canterbury and York. The arguments against the acceptance of the existence of such an organization are most weighty. Gaul and Britain were divided into a number of territories, held by different tribes, often at enmity with each other, rarely uniting even against a common

* *Commentaries*, book vi., sec. xv.

foe, prone to warfare on the smallest provocation. Among such a collection of peoples, of different races, with different interests, thoughts, and feelings, could there have been such an order as the Druids—not a caste, be it remembered, like the Brahmins—raised above all local and tribal strifes and jealousies, exercising a universal sway amid universal discord?

There may have been some such polity existing within a limited area; with a general assembly of the so-called Druids of the Carnuti, or of that tribe and its allies. But Cæsar himself tells us in the opening lines of his *Commentaries* that Gaul was divided between the Belges, Aquitanians, and Gauls or Kelts, and that these peoples each differed in language, customs, and laws. How then could the Druids have had a universal sway? Modern speculation has assigned them to the Keltic division. Cæsar expressly states there were none among the Germans, to whom the Belgic tribes were closely akin. And no one has claimed any Druidic connection for the modern Basques, who represent Cæsar's Aquitanians.

We may probably accept without question the existence in Gaul and Britain of an order of men known by some such name as Druid or Druith—a barbaric priesthood, with a certain organization, and wielding a powerful influence. That they were the wisest of their fellows is also proved by their position. But we may grant all this without accepting the Druids of the later antiquaries, and their more than regal sway here in Devonshire some scores of centuries ago.

The Druid painted by Cæsar is rather a compound of the Greek philosopher and the Roman judge than a barbaric reflex of the Pagan priest, and has little in common with Pliny's save the name. We can as little believe in the high attainments in philosophy or the collegiate institutions of the Druids, as in the universality of their civil organization; and it is worthy of notice that on this head Cæsar does not speak positively. He has only *heard* that the Druids made their disciples learn by heart a number of verses, and he only *supposes* the reason. It is a curious illustration of the contradictions that meet one on every hand in investigating this subject, that while Cæsar says Druidism came from Britain, and that here its mysteries were best known and taught, Pliny says it was carried hither.

As a suggestion, to be taken for what it is worth as a speculation of my own, I would offer this hypothesis as a possible and partial explanation of the erroneous ideas that the Roman writers entertained concerning the Druids. They

seem to have derived the name from the Greek *Δρῦς*, an oak ; and this being so, it is not difficult to understand why they should have regarded them as in some sort specially associated with that tree. Hence the remarks of Pliny, who wrote, it must be borne in mind, from the report of others, concerning the oak and the mistletoe, in which one seems also to recognize an echo of some features of Grecian paganism. Notwithstanding the assertion of Cæsar that the Druids used the Greek character, we cannot believe that a Keltic race, in barbarous times, went to Greece for a title for their priests, much as we might do nowadays for a new scientific term. It is in the Keltic if anywhere that we are to find the origin of the name ; and though the Keltic for oak, "Derow," may be pressed into the service, there is much more probability in reading the word as we find it in the oldest Irish and Welsh writings, *Druith*, and giving it the interpretation which it then had—that simply of a wise man, diviner, magician. Doing this, we shall find ourselves also in accord with the statement of Pliny, that the Britons were renowned for their practice of magical arts. Williams's *Lexicon Cornu-Britannicum* gives *Druth* as signifying a harlot. The word is clearly one of low character.

A critical examination of the written evidence then, I think, disposes of what we may call the antiquarian or traditional Druid altogether, not only in Devon, but everywhere else ; and substitutes in his place a being akin to the medicine or mystery man of the North American Indians, or the sorcerer or rainmaker of Africa.

But it may be said that the archæological evidence, on which the antiquaries of the last century and their followers relied, points the other way. I have shown that the historical references to Druidism (in whatever sense that word may have been used) in this country are of the slightest, and in no way connected with this part of the kingdom. We shall find the testimony of archæology even more decisive.

It is perfectly certain that at the time Cæsar wrote there were at least two races in this island. He states that the coast country was peopled by Belgic tribes, the inhabitants of Kent differing little in manners from the Gauls, while the inland parts were inhabited by those whom fame reported to be autochthones—natives of the soil. Probably by the inland parts we should rather understand the country remote from the district with which Cæsar himself was acquainted, and include under that head our own county of Devon. And it must be borne in mind that Cæsar had but the smallest

personal acquaintance with Britain. His first incursion (B.C. 55) was little more than an armed reconnaissance. In the following year he did not penetrate into the country more than 70 miles.

Cæsar's statement as to the existence of two races of people here is, however, confirmed by an authority which cannot be disputed. The barrows which have been so carefully investigated during the last twenty years contain the remains of a long-headed race and a round-headed race—the latter the more civilized of the two. To one or other of these the Druids of Britain, if they had any existence, must have belonged. What were these people? Dr. Thurman's answer appears conclusive: that archæological and osteological data establish "the existence in this island of the West of two distinct races in pre-Roman times. One of these, I may repeat, which had lost its supremacy, at least in the south of the island, being the earlier and dolichocephalic, was probably Iberic; the other, being the later brachycephalic, was probably Gaulish, or in other word Belgic."

Tacitus states and Strabo inferentially confirms the idea that the earliest historical inhabitants of Britain were of Iberic, or, in other words, of Turanian origin; akin therefore to the Aquitanians of Gaul, now represented by the Basques. When Cæsar wrote the early Aryan wave was pressing westward, and immigrants from Gaul, whether we call them Kelts or Belgæ, were driving the Iberic tribes into the corners of the land—into Wales and Cornwall, and the distant North, precisely as the Britons of later days were thrust in the same directions by the invading Saxons.

There is no reason to doubt that when the Romans first made their acquaintance with Britain this part of the island was occupied, not by the more polished round-headed races whom we may identify with the Gaulic peoples, but by the long-headed and inferior race—their inferiority being clearly indicated by the fact that they belonged to the stone age, while their more powerful encroaching neighbours belonged to the age of bronze.

If such were the inhabitants of Devon in the palmy days of the Druidic cultus, what place would the highly-cultured priesthood, drawn by Cæsar and believed in by Polwhele and his followers, have had among them?

All the accounts we have of the early Britons picture them as being, with slight exception, a very barbarous folk. Cæsar indeed speaks of the men of Kent as the most civilized in the island, differing little from the natives of Gaul; but he

describes the bulk of the natives as sowing no corn, living by hunting, clothing themselves with skins, dying themselves with woad, and to a certain extent having wives in common. Pomponius Mela asserts that all were barbarians. Diodorus Siculus claims for the dwellers in this western promontory that they were more civilized because of their dealings with outsiders. Strabo and Tacitus liken the Britons to the Gauls ere these had passed under external influence and become effeminate. Xiphilius, as cited by Dio Nicæas, avers that the northern Britons lived by hunting, without tillage, dwelt in tents (Strabo, like Cæsar, describes wattled huts), had wives in common, and took a mighty pleasure in robbery and plunder. Herodian says that they knew not the use of clothes, and were warlike and bloody. Other authorities mention that they were tattooed. In fact the picture presented to us of the dwellers in Britain immediately antecedent to Roman intercourse is that of a collection of savage tribes, resembling in many particulars the North American Indians ere they were brought under European influence, and in other existing African tribes of a far lower type. How far the trade influence, of which Diodorus Siculus speaks, may have ameliorated the character of those who dwelt in Devon it is difficult to say, but apart from that influence their Iberic descent would place them low down in the scale.

Contemporary history, whether general or particular, thus fails to give any proof of the existence of Druids in Devon. Indeed the case against Devon derived from this source is stronger than that against almost any other part of the country.

We turn to archæology. If such a cultus as that ascribed to the Druids ever existed here we should find its traces. Evidence of the religious observances of a pre-historic people is best deduced from the associations of their interments. The examinations of our barrows supply no proof of Druidism, but on the contrary indicate the frequent use of funeral feasts (some cannibalistic) in honour of the dead, and the not infrequent offering of victims to the departed shade. The popular Druid, among such rites as these, would have been as great an anachronism in pre-Roman Devon, or pre-Roman Britain either, as a locomotive.

There is absolutely nothing to connect the stone circles and avenues and menhirion of Dartmoor with the Druids, beyond the speculations of imaginative writers who fathered everything mysterious upon a Druidic parentage, just as an earlier age attributed every difficult work to the devil. Most of the

rude memorials of an unknown past, once fondly deemed religious in their purpose, are now known to be sepulchral, and there is no link to associate the remainder with Druidism. The celts and palstaves, once regarded as the implements (though stone and bronze and not golden) wherewith the Druids cut the mistletoe, are now known for tools and weapons of every-day life. There has never been found, either in Devon or elsewhere, not even in that metropolis of the Druidic cultus—Dartmoor—anything that can be interpreted to have a specially Druidic significance.

We take next the evidence of "survivals." Can it be possible that if such a religion as Druidism had once been the universal or general profession of the inhabitants of Britain all traces of it would have disappeared, especially in a county like Devon, which is so rich in folklore and superstitions of various kinds, much traceable to Northern mythology, much to Roman paganism, some even to that ancient sun worship which is the highest form of the cultus of nature? Yet there is not a tradition even remotely Druidic in its character that can be followed further back than the days of Stukeley, Borlase, or Polwhele.

When we come to inquire into the folk-lore connected with our trees, it is a very curious fact that there is no tree which is so barren of association as the oak. Apart from its connection with the 29th of May, indeed, I do not know of any popular custom connected with the oak, nor am I aware of a single well-marked superstition. Around the ash tree legends and customs cluster in bewildering profusion; the holly and the ivy have been in request for winter decorations from the very earliest times; laurel is still the emblem of victory, the cypress of sorrow, the olive of peace. The oak, this very kernel of Druidical practice, this favourite tree of one of the widest spread and most powerful religions of the world, stands almost alone in its neglect. It is impossible that the oak can ever have been held in such universal estimation, whether here in Devon or over the whole Keltic world, and have sunk into such utter legendary insignificance. The singular persistence which has kept alive so many relics of our ancient solar worship, and which has preserved in such vitality the superstitions of the ash, would assuredly have perpetuated the cultus of the oak had it ever any existence.

With regard to the mistletoe the case is somewhat different. The fact of its rarity in this county, if Dartmoor was a Druidic centre, seems difficult to explain; but the mistletoe has its customs and superstitions, which Devon shares in

common with the rest of the kingdom. The only association however of the mistletoe with religious purposes of which I am aware, is one that has nothing whatever to do with this county, alluded to by Stukeley, and which we must take on his authority. He says in his *Medallie History of Carausius*, quoted in Brande,* that the festival of the winter solstice was the most respectable among the Druids, "when mistletoe, which they called 'all heal,' was carried in their hands and laid on their altars as an emblem of the salutiferous advent of Messiah. (!) This mistletoe they cut off the trees with their upright hatchets of brass, called celts, put upon the ends of their staffs which they carried in their hands. Innumerable are these instruments found all over the British Isles. The custom is still preserved in the North, and was lately at York. On the eve of Christmas-day they carry mistletoe to the high altar of the Cathedral, and proclaim a public and universal liberty, pardon, and freedom to all sorts of inferior and even wicked people, at the gates of the city, towards the four quarters of heaven."†

It does not however by any means follow that the existing estimation of the mistletoe is traceable to a Druidical source. The mistletoe finds a place in the legends and superstitions of several nations, as indeed, from the peculiarity of its growth, in the early days of nature worship was inevitable. In the mythology of our Norse ancestors it plays a prominent part, for it was the only created thing that took no oath not to injure Balder, and by which therefore he was killed. Virgil mentions it when he describes the search of Æneas for the golden bough, which was to be his passport to the infernal regions :

"Through the green leaves the glittering shadows glow ;
As on the sacred oak, the wintry mistletoe,
Where the fond mother views her precious brood,
And happier branches which she never sowed."‡

Pliny speaks of the mistletoe, quite apart from his Druidical references, as a marvellous great wonder in nature, and

* Ellis's Edition, Art. Xmas.

† If Stukeley's inferences anent the descent of this custom from the Druids rest upon no better basis than his belief that the celts were used for cutting mistletoe, and placed for that purpose upon the ends of staves, they will need no further discussion. Our island can have borne little else but mistletoe in these early days if all the celts found were used to cut it. Stukeley, after all, is a little less wild than an unnamed correspondent of the *Gentleman's Magazine*, quoted in Brande, who says that "mistletoe appears to be the forbidden tree in the middle of the trees of Eden !"

‡ Book vi. Dryden's Trans., ll. 297-300.

says that it grew in great plenty on the oak, which is certainly not our modern experience. He notes it as useful in medicine, as specific against the king's evil, falling sickness, &c., and says, "Some observe certain superstitious ceremonies herein, and are of opinion that it will work the better, and with more efficacie, in case it be gathered from the oke the first day of the new moone; also that it be not cut down with any bill hooke, knife, and edged yron toole." Have we not here the germ of his statement about the mode in which it was cut by the Druids, which, so far as I am aware, rests upon Pliny's sole authority, and was with him but hearsay?

There are indeed those who have faith in the medicinal virtues of the mistletoe still; but I believe it has no place in our local herbal.

The only local item of traditional belief which in any way seems to be associated with the Druids is that in the "Glain Neidr" or adder-stone. Borlase says in his *Antiquities* that it was a common opinion in most parts of Wales, all Scotland and Cornwall (and I have heard it in Devon), that snakes "meet in companies, and that by joining heads together, and hissing, a kind of bubble is formed, which the rest by continual hissing blow on till it passes quite through the body, and then it immediately hardens and resembles a glass ring." Now this so-called adder-stone is only a bead of glass, and Borlase in this citation does little more than quote Pliny, whose account of the "glain neidr" Mason versified as follows:

"When in undulating twine
The foaming snakes prolific join;
When they hiss, and when they bear
Their wondrous egg aloof in air,
Thence before to earth it fall
The Druid in his hallowed pall
Receives the prize,
And instant flies,
Followed by the envenomed brood,
Till he cross the crystal flood."

But Pliny herein himself does not believe the Druids, those "cautelous and cunning" magicians; and his account of the "glain neidr" does not at all agree with that of the "gloine-an-Druidh," or "magician's glass," as these adder-stones are called in Ireland. He describes it as of the size of an apple, and in terms which could not apply to a bead or ring of glass. There is no evidence for the existence of the popular Druid, moreover, in a name which is not held to mean more than magician; and the "glain neidr" occasionally found in Devon is rather an argument on the other side.

In some of the more Keltic parts of the United Kingdom we do find ancient, but by no means contemporary, allusion to Druids. For example, the Irish *Annals of the Four Masters*, which commence with the statement that forty days before the deluge Ceasair, granddaughter of Noah, came to Ireland with fifty girls and three men,* occasionally mentions them; but always in the sense of diviner, soothsayer, or magician, and rather as a common than a proper name. Thus under the year 555 A.D. Cohm Colle says, "My Druid is the Son of God." And in Lhuyd's *Archæology* we find "droithe" given for augur in the Irish tongue, and "droid-heachd" for sorcery, magic, divination.

The most ponderous book on Druidism ever penned, that of Davies, already cited (p. 232), is built up on the writings of Welsh bards, who occasionally speak of the Druids, and on the Welsh triads. None of these presumed authorities can be traced in MS., however, further back than the tenth century, and those writers upon whom he chiefly relies are ascribed to the sixth—Taliesin, Aneurin, and Merddin the Caledonian—so that they are divided from the presumed Druidical era by as great an interval of time as that which separates us from Magna Charta. Moreover, these assumed productions are in great part so mystical that an ingenious speculator may make anything of them he likes. Mr. Davies converts the bards into Druids by the simple process of calling them so, and treating the two as identical. His Druids are mystics, the shadows cast by the bards upon the dim background of the past; and in the influences of Christianity upon the old Keltic paganism, couched in mysterious phrase beyond ordinary comprehension, he sees—not the dawn of higher things, but the last days of a setting patriarchal faith.† The bard, the minstrel, the scald, the gleeman, are common to nearly every barbarous or semi-barbarous nation, and by no means necessarily connected with its priesthood.

If Welsh and Irish literature fail to support the modern Druidic idea, is there, however no trace of Druidism in the ancient Kornu-British, the language once, not merely of what we now call Cornwall, but of great part of Devon? The answer must be emphatically in the negative. Even the name does not occur in Cornish literature, speech, or legend.

Polwhele indeed asks his readers gravely to believe that in Drewsteignton we are to see "the Druids' town on the Teign,"

* On the 15th day of the moon, which was the Sabbath, adds O'Flaherty.

† Mr. Davies derives Druid from Der Wydd, "superior priest or inspector." Owen, in his Welsh Dictionary, gives "dryw" as both Druid and wren.

in utter defiance of the claims of its ancient possessor, Drogo, whose name was prefixed by way of distinction to that particular "Teign town." But there is hardly a fact more clearly established than the non-existence in the West of England of the slightest trace, even such a casual one as this, of Druidic tradition. Mr. W. C. Borlase, M.P., in his *Nænia Cornubia*,* quotes Professor Hunt and Mr. Bottrell as agreeing in the "verdict that the name 'Druid' does not enter into one single tradition which can be ascribed to a date anterior to Borlase's work." This is wholly inexplicable if in the popular sense the Western Druid ever had any existence, seeing not only the existing wealth of our folk-lore, but the fact that the old Keltic tongue of this peninsula lingered on in Cornwall until the last century. Another important point is, that there is no lack of other tradition. Most of our rude stone monuments have their legends, some evidently of great antiquity; and with regard to those very rock-basins which have caused so much controversy, you will be told on Dartmoor that they were used by the Jews to keep their money in when they paid their workmen in the tin mines.

My conclusions are, that the popular idea of the Druid has originated wholly in the speculations of recent and largely local writers, who have created in their imaginations a race of Druids out of the slender and contradictory materials afforded by classical and late writers and tradition, which they have asked the world to accept as historical. That, so far as Devon, and indeed the whole West of England, is concerned, neither history, nor tradition, nor folk-lore, nor archæology, afford the slightest trace of Druidic existence; whether in the sense of Cæsar and Pliny, of the Welsh bards, or of the constructive ideal of Borlase and Polwhele. That indeed the whole main argument for their existence when examined utterly fails, since neither Cæsar nor Pliny wrote concerning them from personal knowledge; since the professedly historical accounts are contradictory; since the mental and social condition of the races among whom the Druids are said to have lived renders it impossible that the high status assigned to the Druids can be true; and since neither survival of superstitions and customs nor archæology affords the smallest trace concerning them. There is, in short, no better foundation in fact for the Druidic idea than somewhat akin to the medicine man of North America, or the sorcerer of the negro races; and the name is clearly traceable, not to the oak, but to the presumed possession of magical power.

METEOROLOGICAL PHENOMENA.

BY EDWARD PARFITT.

(Read at Totnes, July, 1880.)

THE season of fogs and storms and intense cold we have passed through since we last met has been so remarkable, that I thought an examination of them might prove interesting to our meteorological members, as well that I desire to give my observations and notes a permanent place in our *Transactions*. The fogs particularly arrested my attention, from their frequency and persistency. The like, so far as I can ascertain, has not before been seen in Exeter, to which place I more particularly refer in this communication. Thus, in October, we had five; in November, eleven; December, sixteen; and in January, six; making thirty-eight in all of days and nights we were enveloped in a dense white fog. The fog did not always continue throughout the whole day; there was a break generally in the middle of the day; but when the sun declined, the fog followed rapidly, so that in many instances the street lamps were rendered invisible at a short distance, and when near they had the appearance of rush-lights only. Fog in meteorology is a cloud resting upon or near the surface of the ground or on water. Fogs in general are a consequence of the cooling of the atmosphere; the moisture held in suspension becomes condensed into minute particles or globules of water. When fogs are said to rise over rivers or standing waters, they do not then rise from the water; but, there being a greater evaporation over water and along river valleys than on the land, the moisture which was before invisible is rendered visible by the cooling of the air along the river valleys; thus you see a mass of fog hanging like a curtain or standing up as a wall over the tortuous course of a river, when none is to be seen on the land. These particles of moisture, so condensed and rendered visible, are a conse-

quence of the particles intersecting each other at every point, the condensed moisture being rendered almost opaque. The pluvial and cold season we have experienced in 1879 has been most favourable for the production and spread of these fog-clouds, as the earth was so saturated that it gave out moisture almost as freely as a river or piece of water; and fog, as a rule, in very still weather, and when the temperature is low, hangs about tall objects such as our Cathedral, or the tops of tall trees, or in tropical and sub-tropical countries round the tops of mountains, where the air is sufficiently cool to render the before invisible vapour, visible.

In cities and large towns the fog, from its density and resting near or on the ground, arrests the smoke in its passage, and the two mingle together into that yellow sulphurous mass called a London fog, which this last season has proved so destructive to human life, as well as to the poor animals that were exposed to it.

Exeter fog, from its fewer inhabitants, and the less amount of carbonaceous matter projected into its atmosphere, did not prove so noxious as the fog in London; at the same time it created sometimes difficulty of breathing by those whose respiratory organs were not of the strongest. The thickness and persistency of the fogs here in Exeter suggested to me that I should like to know more about them, and it struck me that I might possibly get some knowledge by the use of the microscope. I therefore, on December 16th, exposed some glass slides and glass micrometers, for several hours in my garden, on a box standing about two feet high from the ground. The first objects which arrested my attention on the micrometer were a number of minute spherical bodies, varying in size, the largest measuring the 144,000th of an inch in diameter. There were many spicular bodies; one specially arrested my attention; it was pin-headed, like the spicules of many of the sponges which grow upon our shores. The whole of them had that peculiar translucence which is seen in *silex* when examined by transmitted light. In examining these various substances with the microscope, I made rough sketches of them and numbered them, as I made my notes of what I found. Thus No. 4 was a round, flat, reticulated structure, the centre showing the light through the net-work of meshes. This measured about the 2,400th of an inch in diameter. Nos. 5, 6, 7, were comparatively opaque, and made up of very minute dark rings; they were probably portions of some vegetable tissues. They

measured about the 36,000th of an inch in diameter. No. 7 had very much the appearance of a piece of moss, having short leaves standing out conspicuously from the branches; the leaves, if I may so call them, appeared more like black spicules of carbon; a very pretty irritant to get into one's lungs; it would be, I presume, something like swallowing a miniature *chevaux de frize*. A very remarkable form, the only one I saw of the kind, reminded me more of a minute sea-urchin than anything else I could think of. It was seated on a transparent membranous-looking disk, the "urchin" being round and seated in the centre of this, and thickly covered with spicules radiating from the centre; the spicules were black, and projected over the transparent disk. The disk itself was sparsely studded with minute black rings. This measured the 180,000th of an inch in diameter. No. 11 was, I believe, a moniliform chain of vegetable cells, so nearly like the necklace of cells forming the fruit of *Nostoe macrosporium*, that I am inclined to regard them as such. There were numbers of pieces of human hair and the wool of sheep, many of them thickly encrusted in particles of carbonaceous matter. These carbon particles, in most instances, appear in minute circular rings, so nearly like the cell-like pores seen in a thin section of coniferous wood, situate between the perpendicular woody fibres, that I am almost inclined to regard them, if not identical, then very nearly allied to these. No. 14 was a very beautiful microscopic object; it had the appearance of a piece of silix, and on one edge, which was peculiarly fractured, it showed that the substance was composed of several layers. In this silicious-looking object were imbedded two spiral vessels, one of which was as perfect as any I have ever seen in the stems of plants. There were, besides what I have described, numerous pieces of soot or carbonaceous matter; so numerous that it struck me as marvellous how the functions of the respiratory organs could be carried on at all in such an atmosphere.

On December 23rd, during a very dense fog, I again exposed some glass slides and glass micrometer scales in my garden, for about an hour between six and seven in the evening. The greater number of the particles found on these exposed glasses were similar to those found before. There were, however, a few that were quite different in character and structure. The number of minute, thin, irregular bits of what I believe to be silix was very remarkable; many of them had the conchoidal fracture almost peculiar to silix in its various forms.

On one of the slides I found the mycelium of a species of mucor or mould, bearing two sessile sporangia and two stipitate, having globose heads, not sufficiently developed to determine the species. It was of a delicate blue colour, like most of the common moulds found on jam-pots, old bread, &c. Nos. 4 and 5 of this lot were two asci of some fungus or lichen. They were slightly curved, and had four spores in each ascus. I do not know any fungus fruit like them; but they agree more especially with the spore cases of *Ramalina calicaris* than anything else I am acquainted with. Nos. 6 and 7 were minute translucent bodies, flat and scale-like, red, with white margin, and having spore-like bodies in the centre, quite unknown to me. No. 8 is cylindrical, thickly set round with very sharp, needle-like points. These must prove terrible irritants to the delicate respiratory organs, both of the human as well as of animal subjects.

There can, I think, be little doubt that respirators would prove of great, nay, almost of incalculable benefit to persons finding it difficult to breathe in an atmosphere holding such substances in suspension as I have endeavoured to describe, and I hope it may be a long time before we are again subjected to such an ordeal of cold and fogs as we have just passed through.

But these periods of cold and heat which we have been experiencing have come and gone without arresting the attention they clearly deserve; and it is only a few persons one meets with that are impressed with a certain summer or winter, when either the great heat or the great cold has printed itself upon their memory.

The last summer being so very wet, cloudy, and with low temperature, the mortality amongst the sheep, the bad harvest, &c., will be remembered by a great many whose business it is, and who are interested in more ways than one in agricultural pursuits.

Now what I wish to point out is this, that, so far as is at present known (and this is being confirmed with every returning cycle), similar seasons recur at certain given times. There may be a difference in the intensity of either the hot or the cold waves; but, so far as can be ascertained, they are sure to come at their appointed time, and that time is not new, although the study of it is new to us. But it has been discovered on the astronomical clay tablets, the books of the Egyptians, now preserved in the British Museum.

The Egyptian astronomers and agriculturists were fully aware of the recurrence of these good and bad seasons, and

I think that, knowing these, they in all probability made preparations for them.

The period arrived at by the Accadian astronomers for their seasons of great prosperity and abundance was twelve years; and they also found by observation that these years of plenty, in some manner unexplained, coincided with the return of the spots on the sun, so that we are just beginning to learn what was known to these Eastern peoples several thousand years ago; or, in the words of Professor Sayce,* "the Accadians had anticipated our almanack makers in discovering a connection between the weather and the changes of the moon. Indeed all kinds of astronomical phenomena were supposed to have an influence upon the clouds; and in anticipation, as it were, of Dr. Hunter, the investigator of the phenomena in India, the same weather was expected to recur after a cycle of twelve solar years. . . . Even the appearance of the sun was not allowed to go unnoticed, for in one place we are told that on the first of Nisan it was 'bright yellow,' and in another that it was 'spotted.' Who," says the professor, "would have thought of looking for a notice of sun spots on the clay tablets of ancient Babylonia?"

The Committee on Solar Physics, appointed by the Lords of the Committee of Council on Education, have brought together in their Report, published in *Nature* May 13th, 1880, pp. 44, 45, a great body of evidence tending *prima facie* to conclusions of the utmost importance; and Mr. G. G. Stokes, one of the Committee, says, "It so happens that for the last year or two the sun has been in a condition of unusual quiescence, so that in the whole series of photographs sent home by Mr. Meins, from the Observatory in India, there were only two or three small spots. But it is well established by previous experience that the sun passes alternately through a condition of few spots and many spots, the whole period of change being about eleven years."

We are now, according to the reckoning, entering on a period of solar activity, and already spots have begun to appear. The present time and the immediate future form therefore a period of special interest for the observation of solar phenomena. The directors of observatories in all parts of the world have now entered upon the work of strictly observing and photographing the sun, so that the next eleven years will prove a sort of crucial test of how the disturbed or quiescent state of the solar orb manifests itself on the meteorological conditions of our earth.

* *Lectures Delivered at the Royal Institution, 1879, pp. 53-4.*

On consulting the large work of Mr. R. C. Carrington, *Observations on Sun Spots*, illustrated with 166 plates, published in 1863, begun on March 9th, 1862, and continued through one cycle or revolution of this phenomena, I find the exact measurements and the localities of the spots on the great luminary depicted on these plates; and it is there shown that in 1855-56 the sun was quite free from spots. This then was regarded as the minimum period; from this, the sun began to be spotted, or the period of activity had begun; the spots gradually increased in number and size up to 1860 and 1861, when the two hemispheres were so thickly maculated that they must be seen to be believed; from this to the end of the cycle a gradual decline was observed, ending with 1866, when the sun was again free from spots, bringing the cycle to eleven years. There are, however, some conditions of the earth which seem to militate against the otherwise ruling power of the sun. For instance, the waves of cold and the waves of heat do not fit in *exactly* according to the maximum and minimum periods of spots, but that they follow close upon them does appear to be a fact so far as at present can be ascertained.

Devonshire, with its mild and beautiful climate, perhaps offers as fair a test-district as could be desired for noting especially the waves of cold that at certain times sweep over the land, and I thought an enumeration of these waves might prove interesting, as they have been tabulated at this Institution* since 1813. The register was however better kept, or in a more scientific manner, from 1829; but there is nothing particular to record for that year. I will begin with the year 1830. Almost every locality, as is well known to meteorologists, has some features peculiar to itself, and the register is therefore to be read for that locality, and not for the country generally. At the same time the waves of cold and heat do not come under this local influence, which I am about to eliminate from the register kept at this Institution; it may be taken with very slight exception as representing Exeter. Unfortunately, however, for carrying out this examination of our records on a uniform basis, we had not a minimum thermometer registering the cold near the ground until 1852. The one in use was placed three feet from the ground; this must therefore be borne in mind, as the difference between a minimum thermometer placed about an inch above a grass plot, and one placed in shade about four feet from the ground is considerable; the former registers as a rule from 8 to 10 degrees colder on the grass than the one above it.

* Devon and Exeter Institution, Exeter.

I will begin with the winter month, or December, 1830. The thermometer, placed as above stated, registered 18 to 19 degrees of frost, and flocks of wild geese were observed; the cold in other parts had driven them down to a more favourable climate. In 1838 the Exe was frozen over, the thermometer fell to 17, or 15 degrees of frost. The next cold wave did not occur till 1850. The cold set in towards the end of December, and reached its minimum on January 9th, when the Exe was frozen over. The next cold wave was in December, 1859. It began on the 15th and reached its minimum on the 16th. The thermometer registered 9, or 23 degrees of frost; this reading is taken from an instrument placed on a grass plot about two inches above the grass; it will be from this that the rest of the readings will be taken. On the succeeding night it registered 11, or 21 degrees of cold. The next I have to record is in 1861. The severe cold of that year began on the 19th of December, when the Exe was frozen over; the temperature fell to 19 degrees, and two nights after to 9 only, or 23 degrees of frost; it then rose to 13 with a heavy fall of snow. In January, 1862, on the 6th, occurs one of the lowest readings ever recorded here; namely, 7 degrees, or 25 of frost. The next cold wave reached us in December, 1871; it began with the month, and registered respectively 16, 12, 5, 13, 11·8, 14, 12, 11, 10 degrees; from this the temperature gradually rose. From this we are carried on to the eventful year of 1879; and it was a year full to the brim of disasters, bad harvests, bad trade, banks breaking and general depression; a year more full of events it would be difficult to find in the annals of this country. The cold began in November, when the mean for that month was only 20·1 degrees. In December the lowest reading was 10·5 only; the Exe was then frozen over, and on the 6th and 7th there were hundreds of people on it; it had the appearance of a fair, and the skating and sliding by torch and firelight above Exe Bridge had a very pretty effect at night. The mean cold for this month was 20·8. On the 14th a thaw began.

January, 1880, the minimum temperature was very variable, ranging from 39 to 9 degrees. The Exe was again frozen over, and, what is a very unusual occurrence, the Exe between Lympstone and Powderham during the neap tides was frozen over, so much so as to prevent a steamer passing through it to the canal, or a ship coming from the canal from going to sea.

Recapitulating the years of the lowest reading of the thermometer, and comparing them with the minimum assigned

to the spots, or rather when there are no spots on the sun, it will be seen at once that our minimum here of cold does not exactly coincide. At the same time, I think everyone will admit that the regularity of the appearance of the waves of cold which we experience must be governed by some law, and whether that law resides in the physical condition of the sun remains yet to be proved. One difficulty besets the solar physicists, and that is to fix the exact data of the minimum; for it would appear that this is not always of the same duration. Thus Messrs. De la Rue, B. Stewart, and B. Loewy * say we have—

From the first to the second minimum	.	9·81 years.
From the second to third minimum	.	12·58 years.
From third to fourth minimum	.	10·81 years.
		<hr/>
Mean of three periods	.	11·07 years.

The years of minimum cold according to our register are as follows: 1830, 1838, 1850, 1859, 1861, 1871, 1879, which gives a mean of 9·4 years. According to this we are two years in advance of the minimum sun-spot period as now calculated by the solar physicists.

* *Transactions Royal Society*, 1870, vol. clx. p. 393.

PHYSICAL FEATURES OF DEVONSHIRE.

BY W. A. R. USSHER, F.G.S.

(Read at Totnes, July, 1880.)

BEAUTY presents two aspects, that of mould and that of mood, or of form and of expression.

In nature we obtain the former always, more or less, combined with the latter; but often find the latter, the changing moods of nature, endow a homely vista with such charms of tone and colour, when beauty of form is entirely absent, that we rest satisfied without it.

A sluggish canal bounded by rows of formal trees, and overlooked by an uneven range of red brick buildings, is by no means a beautiful object; yet, combined with the ethereal greys of cloudland, and lit up by the fitful glow of a summer noonday, such scenes depicted by the brush of Van der Heyde are transformed, as if by magic, into a poem of colour, that could scarcely be enhanced by its application to the flowing lines of formal beauty. And who is there who would prefer the classic beauties of composite landscape from the pencil of a Both or Berghem under the warm glow of a misty sunset haze, to the quaint little courtyards of De Hooze with the sunlight streaming across their particoloured tiles; or to take a jump over a host of the productions of the Low Country giants and of more modern schools, to that matchless rendering of a common theme, "Returning to the Fold," by H. W. B. Davis, in this year's exhibition at the Royal Academy, wherein the home landscape and the fleecy flock are picked out and made poetic by the subtle evening sunlight that pervades the theme.

Thus by the wonderful balance of Nature, the picturesque may be found in regions where she presents neither grand nor bold contours, and when the charming swell of wood-crowned hill and grassy dale appears not. A few adventitious figures,

boors and ploughboys, with a Dobbin or a Rosinante, supplied the materials for Morland's genius, whereby the wayside inn, the hedges of a country road, or sombre gloom of a thicket, became a picture. In the same homely school, but more refined, the rugged oaks of a Norfolk woodland, the thatched gable of a cottage, furnished old Chrome with many a theme, wherein the red petticoat of some rustic lass hung out on a clothes-line often supplied the balance of colour, and contributed no small share to the beauty of the homely composition.

I may be pardoned for this introduction to so inartistic a theme as a geological paper. "Examples gross as earth exhort me." Even so; yet *not* to follow dips, and strikes, and faults, and subterranean relations of strata. My business is with the surface, and this bald essay lays claim to naught but a superficial description of such general excrescences and depressions as the great carver, water (call it subaqueous and subaërial denudation, if you will), has left, outstanding beacons "which the wizard Time hath set to count his ages by," or channelled into all the various ramifications of a river system.

Form is a study of as infinite importance to the field geologist as to the landscape painter. The one sees it as it is, and revels in its infinite expressions, chasing one another in many harmonies "from morn to dewy eve," and changing in character as the seasons pass. To the geologist, as such, the beauty of expression is a dangerous delight; he has to study form as it is too; not for its beauties, but for the meaning of its characters.

Geologically speaking, everything (except the most recent gravels and river deposits, glacial drifts and beaches) is called a rock, be it loose sand or hard grit or quartzite, soft marl or hard mudstone or limestone. It is the variety of materials forming the exterior crust of the earth, that, yielding unequally to the sea and rains and rivers, gives the diversity of surface.

Features are the distinguishing marks of that diversity. The features of any country are dependent on the relative hardness and structural peculiarities of its rocks.

It is very important that the word relative should be borne in mind; for it is a considerable anatomical distinction, forbidding the comparison of the anatomy of the human features. The study of human anatomy is absolute, and, once learnt, the reasons for all divergences of facial type are comprehensible. Not so with the geological features of a country.

The hills of a district entirely composed of soft rocks may

exceed in height those of a district entirely composed of hard rocks of a homogeneous character. The great plain of Central Ireland is composed of carboniferous limestone, and so are the Mendip hills.

Besides this distinction of local association, inequalities in the forces of abrasion, and also the effects of subterranean movements, preclude the possibility of constructing an anatomical table of the rocks composing the crust, with relation to the rugosities of its surface.

This is well illustrated by a comparison of the long, almost even, swell of the Middle Devonian slate hills, extending east from Morthoe and Ilfracombe, with the broken districts of hill and dale made by beds of the same age in South Devon, between Torquay and Plymouth.

It is not within the scope of this paper to enter into a dissertation on the particular relations of the groups of strata, or to discuss the reasons why they present certain distinctive surface characteristics, but simply to show the intimate relation that subsists between the rocky framework of a country and its surface moulding.

As every geologist knows, the greatest part of Devon is composed of Palæozoic rocks, ranging in time from the Silurian to the Carboniferous epoch, forming a great trough, the axis of which in the upper beds of the Culm-measures (consisting of hard even-bedded grits), runs in an east and west direction along the latitude of Eggesford. From this axis, proceeding northward, we encounter older beds; and pass from the base of the Culm rocks at Barnstaple into the Devonian area, and, crossing the Lyn Valley, meet with the oldest Devonian rocks of North Devon, ascribed by Professor Hull to the Upper Silurian.

Proceeding south from Eggesford we cross the middle beds of the Culm-measure series, bounding the Triassic valley of Crediton on the north, and pass into the districts of the lower Culm rocks on the flanks of the Dartmoor granite, entering upon the Devonian area near Tavistock and Ashburton; whence to Kingsbridge curves, broken and repeated by faults, render the Devonian area extremely complicated, a complication further increased by the irregularity of the limestones of the Middle Devonian series, and by the presence of numerous strips of intrusive rocks.

In the metamorphosed rocks of the Bolt Head and Prawle Point we encounter what appear to be the oldest beds in South Devon.

The Dartmoor granite is supposed to have come up very

unhandsomely through the Culm-measures and subjacent Devonian rocks, without producing a quaquaversal dip away from its margin in the Devonian rocks so rudely broken through, and even without exposing these older beds at all on the northern margin of its tract of more than 200 square miles in extent. This great mass is supposed to have come up somehow, *mirabile dictu*, without leaving little outliers somewhere on its surface, to indicate that Devonian rocks had been punched through at all or been borne up by it. But this is a question for faith and not for sight, and, moreover, it is very ungrateful to object to any method of intrusion when the intruder is so infinitely superior to his surroundings, and so indispensable an element in the beauty of Devonshire scenery.

The Secondary rocks form the eastern part of the county, east of a line drawn from the abode of our invaluable Secretary, Clayhanger, to the flourishing town of Totnes.

From this area they extend in tongues encroaching on the Culm-measure districts in the Tiverton valley, and in the Crediton valley, where traces of their former extension are met with as far west as High Hampton, to the west of Hatherleigh. (The Triassic outlier of High Hampton was found by Mr. Martin, who told me of it: as it was beyond the limits of the district upon which I was then engaged, I should not have otherwise had the opportunity of mapping it.)

We shall now take up the general characters of the features with relation to the formations in the following order :

1. Devonian of North Devon.
2. Devonian of South Devon.
3. Culm-measures.
4. Dartmoor.
5. Triassic area.
6. Greensand (Neocomian) area.

NORTH DEVON, DEVONIAN.

The Devonian rocks form the northern extremity of the county of Devon, occupying a superficies of about 209 square miles ; they constitute, in part, districts of greater elevation than any to be found north, south, or east of Dartmoor. From north to south this area presents alterhate bands of barren moorland, and tolerable arable and pasture land, indicating the alternation of the three great grit divisions of the Devonian beds with slates. This may be more readily understood from the following table, giving the Devonian beds in ascending order, with the superficies occupied by each in North Devon :

		Square Miles.	
Lower Devonian	{ Foreland Grits	3	} 14
	{ Lynton, even bedded Grits and irregular Slates	11	
	{ Hangman Grits	13	
Middle Devonian	{ Slates and Shales of Morthoe and Ilfracombe types	60	} 73
	{ Pickwell Down Grits and Slaty Grits	45	
Upper Devonian	{ Baggy and Pilton Slates with Grits	77	} 122

Foreland Grits.—Hall Hill, near Countesbury, is said to be 1145 feet in height. The little bit of North Devon occupied by these, its oldest, beds is a barren moor with steep seaward slopes, or rather cliffs masked by talus, and terminating in low rock-faced bases by the beach. The revelations of the cliff base are all-important to the geologist, as the relation of these beds to those of the Lynton series (except at Oare) is not exhibited. But when by dint of delicate going he has got down what appears to be a tolerably passable slope, and is not far from the goal, a steeper incline, and uncertain feeling as to the duration of his step adown some mobile stone stream, warns him to give up the hopeless task.

The Foreland rocks of North Devon may be rather regarded as the eyry from which we may admire the surrounding scenery, than as at all attractive in themselves; but looking from the Foreland past Desolation Point, the bold seaward slope of the masked cliff line and the absence of foreshore, with the barren hill-tops above, constitute a *tout ensemble* which is by no means despicable to the lover of Nature; as when the sun is up, and flitting clouds play their wind-driven shadows over the slopes, and in the clefts and gullies, in chequer-work of golden light with sombre red and grey; or when the white foam drives angrily against that little envious bourne of cliff we wish to get at, and all overhead is dark with brewing storm, save where ominous cold light breaks in through the dun sky, and the shrill plaint of the sea-mew, borne on its strident wing, is well attuned to the scene,—then Desolation Point looks its name.

Every one knows what Lynton is like. The castellated crags of the Valley of Rocks are partly grotesque withal, because those quaint shapes are evenly structured in tiers, marking the characteristics of the even bedding planes of the Lynton grits, and their low dip lends itself to a comparison with the ruins of old battlements left standing midst the wrecks of rased castle walls. Viewed from Countesbury, Lynmouth lies at the foot of a great cone, rising sharply from

the sea to a height of 800 feet or more, and lost landward in the leafy bowers of Lynton nestling on its side. This conical structure is often reproduced by the Lynton beds in minor features, as are the crags of the Valley of Rocks. Opposite Lynton a fine bold crag breaks through the slope and frowns upon the West Lyn valley below, which, by the way, reminds one of a curious fact. Full often, where the inclination of the rocks exhibits the least amount of subterranean disturbance, or where the beds are horizontal, the valleys are guarded by precipitous sides, the scenery is often fine, and the cliffs steep. I suppose it is because the denuding agencies have no such inducements to leave their initial grooves, as would be presented by changing dips, fractures, and flexures, and so do their work thoroughly, *ab ovo*. The Lynton beds certainly have lesser angles of dip than the other divisions of the Devonian group. The Lynton beds are exposed in fine cliffs in the windings of the East Lyn Valley below Brendon.

The sunbeams peering through the leafy prison to sparkle on the wedding of two little purling brooks is Watersmeet on a fine day in summer, as every tourist may recall to mind without the aid of "Black or White." Above Barbrick Mill a far less interesting tract of land running to Trentishoe, with a rather barren aspect, and, except near Heddons Mouth, seldom at all attractive, introduces us to the barren moorland tract formed by the Hangman Grits, "a land of brown heath," but little wood, smooth or rugged, and very unattractive, except on the coast, where it forms the peaked outline of the Little Hangman (over 750 feet in height), a very pleasing break from the shoulder of the dominant high ground of the Great Hangman (1,083 feet in height), whether viewed from Lynton, or from the Ilfracombe side.

In Combe Martin Bay we have the junction between the slates and grits of the Middle Devonian series well shown in a fine cliff section; but when traced inland the boundary is scarcely to be distinguished by feature, although in most cases the changed aspect of the soil is a rough indication of its latitude.

Sherecomb or Sherrycomeout Gorge breaches the Hangman range, separating the Great Hangman from the hill west of Trentishoe Barrow, 1,187 feet in height.

The gorge is so steep and narrow that the sunlight of a summer afternoon strikes sharp against the shadow on the slopes, and makes a garish contrast in the sudden transition from cool shade to warm light on the ascent.

Except on the coastline and in the stream gorges, the

general contour of the Hangman Grit districts betrays more gentle slopes and more flowing lines than do the grits of the Foreland series or those of the Upper Devonian; but these beauties of outline, so noticeable a feature in the heights of Dunkery and in the Quantocks viewed from the west, are confined to Somerset, the shape of the Little Hangman being somewhat indicative of them. In North Devon the Hangman Grits exhibit undulating moorland tracts with no noticeable features, and Chapman Barrows, attaining a height of 1,540 feet, is composed of the Ilfracombe slate series, being the highest point of the Middle Devonian in Devon, whilst in Somerset the reverse is the case, the Middle Devonian Grits in the Dunkery range and the Quantocks forming the dominant features.

The Middle Devonian slate series affords the most varied coast scenery in North Devon. The angry jagged reefs of the Morthoe and Bull Point promontories, with their uniform pale greenish-grey tint, give place to the more precipitous but less rugged coast line formed by the lower (Ilfracombe type) beds of the series; and to the latter the association of more heterogeneous materials has imparted a variety of tint varying from silver grey and steel grey hues that shimmer or blaze in the sunlight, to pale reddish and warm grey tones of exquisite delicacy. Few can deny that Mr. Naish seeks his inspirations on a favoured shore.

To the north of Morthoe the rugged broken ground, with its steep slopes and bramble brakes, and outcropping crags, is all in keeping with the inhospitable cliffs below.

Here and there, as we traverse the districts formed of this great slate series, the steep slopes in the major valleys are broken by outcropping grey crags, such as those that frown in rugged scars upon the nascent course of the Bray near Chapman's Barrows. Of this nature are the tors of Ilfracombe, rocky peaks that mark the successive outcrops of broken *arrêtes* of slate; but which are seldom seen, as here, upon the hill crests. This craggy character is very noticeable in West Somerset, and the Ilfracombe tors are represented in the valleys of the Exe and Barle, by conical crag-crowned hills. As a rule, the summits of this slate series are tame and uninteresting, and the slopes are long and tedious, principally grass land, of the quality of which I do not profess to be a judge, diversified by patches of moor and, here and there, tilled slopes. The valleys, where wooded, as at Berry Narbor, near Bittadon and near Arlington, go far to redeem their uninteresting surroundings.

The Upper Devonian Grits (Pickwell Down series) rise in a long, unbroken swell of moorland, sometimes abruptly, sometimes gently, from the slate districts on the north, and dominating the Upper Devonian slates and more distant Culm-measure area on the south. This range attains its highest point in Span Head, on the borders of Somerset, 1,610 feet above the sea. It has a considerable breadth at North Molton ridge, whence it sends off a spur to East Buckland. The well-wooded valley of the Bray intersects the main ridge and its bifurcation, and affords along its course many pleasing diversities of feature, as it breaches the slates and grits of the Upper Devonian, and passes into the Culm-measure area to the south.

The north face of Baggy Headland shows the junction between the Indian-red coloured slates of the Pickwell Down series, and the green basement slates of the overlying beds, in a fine bold cliff. A bold sandhill-skirted down flanks Woolacombe Beach, and the exposure of Upper Devonian beds is confined to the Baggy and Saunton promontories.

From the coast the Upper Devonian slates extend over an area of broken, hilly ground. The hills have rounded shoulders falling steep down to the valleys. The presence of grits in the slate series adds much to the diversity of the district, assisted by the constant flexures into which the beds have been thrown. Numerous farmsteads, well wooded valleys in many places, the constant alternation of hill and dale, of arable and pasture land, with fewer salient points of interest than those exhibited by the areas formed by the Middle and Lower Devonian slates, impart a character of more general attractiveness to the districts formed of Upper Devonian slate.

DEVONIAN OF SOUTH DEVON.

The area occupied by Devonian rocks in South Devon is about 376 square miles, forming the southern extremity of the county, with the exception, perhaps, of the district bordering the coast between Bolt Tail and Start Point, which may be formed of beds of still more ancient date.

In two very important particulars the Devonian area of South Devon differs from that in the North; namely, in the elevation of the summits, and in the continuity of arrangement of the hills.

In the first place the elevations of the South Devon district are insignificant, as described by De la Beche in the following passage :

"On the S.S.E. and S.E. of Dartmoor the country, though hilly, is of moderate elevation, the most marked high land being Black Down, on the W. of Modbury, and Morleigh Downs above Morleigh, until we arrive at that portion of the South Hams, as this part of Devonshire is named, of which the coast of the Bolt Tail, Bolt Head, the Prawle, and the Start Point, forms a part, and also the most southern land in Devonshire. The Bolt Head rises only 430 feet above the sea, though its bold outline generally impresses the spectator with the belief that it attains a much greater elevation."*

Next as to the continuity of range in the hills. This is much more marked in North Devon; the broken ground made by the Upper Devonian slates in that area offering a more regular arrangement of hill-tops than is, generally speaking, to be found in South Devon; though the character of their contour in other respects approximates somewhat to that in South Devon. This slight analogy is occasioned by the flexures affecting both districts, and by the association of heterogeneous materials with the slates in each area.

The more broken character of the scenery of South Devon is largely due to the great number of dislocations, rendering it excessively difficult to trace the continuity or contemporaneity of the igneous rock bands and limestone masses associated with the shales and slates. These faults run in the direction of the dip as well as of the strike, and chop up and transpose the outcropping features of beds which would otherwise run in nearly continuous lines. I have seen a little of the geology of this complicated district in the vicinity of Totnes, under Mr. Champernowne's able guidance, but am personally very slightly acquainted with it, my researches being confined to the neighbourhood of Paignton and Slapton, with cursory glances at the environs of Kingsbridge, Ashburton, and Plymouth.

The South Devon district is more picturesque than that of North Devon in its pleasing diversity of hill and dale, thickets and woodlands, parks and pastures, varying from poor grass land to rich meadow, chequered with cultivated fields. But in coast scenery North Devon bears the palm.

It is, however, in the valleys that South Devon presents her chief charms. There is no river scenery in the Devonian area of North Devon to compare in kind with the Dart (absurdly likened to the Rhine, with which it has no beauties in common, of course allowing for the great disparity in size). Leaving its cradle ground of Dartmoor, dancing merrily over

* *Report on Geology of Cornwall and Devon, &c.*, p. 5.

a boulder-strewn bed between the steep heather and bracken-clad slopes of Holne Chase, it plunges at Holne Bridge into sylvan shades, and passes by Buckfastleigh and Staverton, and the slopes of Dartington, to Totnes; from thence it assumes an entirely different aspect, winding through a gorge of steep wooded cliffs and gentle slopes, and widening into the estuary of Dartmouth. Near Dartmouth are quiet reaches overhung with graceful drooping boughs mirrored in the still water.

Dartmouth itself, on bright days in summer or autumn, excluding modern conveniences, with its quaint nooks and corners, is all in keeping with its pretty river.

Mount Edgcumbe, unfortunately, is on the wrong side of the Tamar, so its foliage beauties must be conceded to Cornwall, a county that can ill afford to dispense with such an adjunct to its scenery.

The low limestone ridges of Oreston and Mount Batten, flanking the slopes that descend from Staddon Heights, are picturesque. The Plymouth limestone, and indeed many of the limestone reefs or bands elsewhere in South Devon, form noticeable features, not for their prominence, but on account of the numerous natural and artificial exposures of the pale grey rock, which has so clean and palatial an aspect that, in spite of its stratigraphical vagaries, we could ill afford to do without it as an element in the picturesque in South Devon.

The flattened summits of the limestones of Berry Head and Churston, and of Babbicombe and Torquay, are relics of old planes of marine denudation, as Mr. Pengelly has pointed out. The limestone promontories contrast agreeably with the dull grey or red-brown tints of the parts of the coast formed of slates, and also in the smooth rounded forms into which they are worn by the waves.

Near Saltern Cove and Broadsands, the lively contrasts in colour produced by the juxtaposition of slates, limestones, and Triassic breccias, are worthy of notice.

The Devonian slate coast line generally presents bare slopes, terminating in low cliffs; but from Start Point to Bolt Tail a rugged coast, with outcropping crags above the cliff face, affords fine bold scenery, having more of the bluff character about the Bolt, whilst at the Start a rugged *arrêté* forms the crest of the promontory. The natural arch in the insulated fragment of Trias on its Devonian slate pedestal, yclept Thurlstone Rock, is of course one of the coast attractions, and a stock example of the meaning of unconformity in geological parlance. The sea on the limestone coasts in still weather is beautiful in its colour and transparency.

I have never visited the Tavistock district, and shall now pass to the great central mass of the Devon Paleozoic rocks.

The Culm-measure area exceeds 1,000 square miles in extent. It affords some very charming river scenery, and locally exhibits very pleasing contours. Its coast scenery is very fine and bold in places; but, taken as a whole, this tract may be regarded as a great undulating table land, the summits of the hills being for the most part broad and flattish, although in the vicinity of the main valleys they often present bold broken outlines.

The most characteristic features in the Culm-measure area are to be found in the districts occupied by the lower beds near the northern margin of the trough, and in the hilly districts overlooking the Triassic area and its spur, forming the strip extending from Crediton to Jacobstow. The former district exhibits the characteristic hogbacked ridges falling in steep slopes from the summit, as exemplified in Coddon Hill (rising to 620 feet above the sea), near Bishop's Tawton, and reproduced less distinctly in places along the line of strike, from thence to Ashbrittle. The buff and grey shales of Coddon Hill are also recognizable here and there by conical hill features, as on Hulverton Hill, near Dulverton; at Swimbridge; and in Tawstock Park and its vicinity. In Tawstock Park the features are a compromise between the ridge, and cone contour, and are repeated in parallel bands by the reduplication of the beds by fault or folds. Somewhat similar features are exhibited to the north of Abbotsham, near Bideford. Eastward from Rackenford to the Triassic area on the south of the sharp deflection in the course of the Tone, the continuity of the summits is broken, as in the prominent hills of Stoodleigh Beacon and Stoodleigh (bearing outliers of Triassic gravels); and further east, the Culm-measure limestones form short broken ridges, scarred by quarries of red weathered limestone, at Kitton Barton, Holcombe Rogus, and West Leigh, passing into the gentler slopes of the Culm-measure area toward Halberton. The character of the Stoodleigh district is somewhat similar to that exhibited by the bold hilly ground near the Triassic margin about Stockleigh Pomeroy, north of Newton St. Cyres, the most notable feature of which is presented by the steep hill on which Cadbury Camp is situated, at a height of more than 900 feet above the sea.

From the watershed boundary between the tributaries of the Taw and Exe, near the Black Dog Inn,* between Woolfar-disworthy and Washfordpyne, an extensive view is obtainable,

* "Boy" in map.

bounded on the south by the lovely broken outline of Dartmoor, and overlooking in the foreground on either side picturesque valleys with wooded sides and steep grassy slopes.

The least interesting part of the Culm-measure area that I have seen is exhibited by the rather low-lying heavy clay lands between Hatherleigh and Okehampton: upon the prolongation of this latitude, the valleys present very few attractions. For hill and dale combined, the broken hilly ground between Haldon and Dartmoor affords, perhaps, the most attractive sylvan scenery in the Culm-measure districts.

The great charm in the Culm-measure area is centred in its valleys; precipitous wooded slopes with farmsteads peeping through the foliage, sharp bends pent in narrow gorges opening into grassy flat alluvial tracts here and there, cannot fail to attract the eye by their diversity.

The craggy sides of the Taw Valley, near Belstone, are in wild contrast to the park scenery and well-wooded slopes through which the river meanders in the neighbourhood of Eggesford and Chumleigh. From its junction with the Mole, the Taw, bounded by a flat alluvial tract of varying width, winds past the Portsmouth Arms to Umberleigh station, the sides of its valley being generally well wooded on the west bank, but formed of steep grassy slopes, nourishing copses here and there, upon the east bank. The broader tract of alluvial land into which it opens at Umberleigh, is succeeded by the park scenery and broken features on its flanks at Tawstock, and thence through its broad estuary, flanked by alluvial land, it flows on to meet its fairer sister stream, the Torridge. The tributaries of the Taw, the Little Dart, and the Mole and Bray, equal, if not surpass, the best features of the parent stream.

The Little Dart, flowing past the picturesque hamlets of Worlington, through steep wooded slopes, broken by the courses of its tributaries, presents a charming variety of sylvan scenery.

The valley of the Mole from South Molton to Georges Nympton affords a pleasing diversity of steep and rounded grassy slopes and wood-clothed sides. The Bray Valley is chiefly interesting on the west bank. The scenery viewed from the new coach road from South Molton to Lynton is very fine. From the fine viaduct east of Castle Hill station it flows past the steep copse-crowned slopes of Castle Park to join the Mole at Meeth. From Meeth the united streams flow in a graceful winding course through steep slopes clothed here and there with wood, and bending sharply round the corner of Kingsnympton

Park join the parent stream at South Molton Road station. The view from the village of Rose Ash, on a ridge of high ground between two tributaries of the Mole, is very fine. The rocky exposures are picturesque by the road at Rowcliffs (Mole Valley, north of South Molton Road).

The Torridge is not less remarkable for the beauty of its valley than for the eccentricity of its sinuous course, which enables it to monopolize the drainage of the north eastern part of Devon. After a course of about 47 miles, it enters the Taw estuary at a distance of only $10\frac{1}{2}$ miles from the source of the Clifford Water (one of its head streams) by the Ditchen Hills.

The scenery of the Torridge Valley between Newton Petrock and Meeth (village), though very picturesque in places, is barren in interest when compared with its winding course by Merton and Torrington, to Bideford. Precipitous sides, now well wooded, now clothed with a dense brake of dwarf oak and hazel, broken here and there with grassy slopes, open in successive vistas with the windings of the stream. The tower-crowned hill of Torrington, with its fine bold slopes, broken by rocky exposures, thanks to the handiwork of man, faces the view of the down-flowing river, emerging from a bend in its wooded gorge, and spanned by a bridge the arches of which reflect credit on the picturesque fashioning of its designer.

From Torrington station, banked against the steep slopes of moorland, and backed by a small clump of Scotch fir, we look down stream over a stretch of flat grass land flanked by wooded slopes, and rendered charming by a most graceful group of trees.

The course of the river by the slopes of Beam and Wear Gifford is often very attractive. Bideford, with its mass of houses clinging to the hillside around the many-gabled church, and its fine old bridge, guards the river's widening course, and the picturesque *mêlée* of whitewashed cottages at Appledore looks down upon its union with the Taw.

The East Okement comes brawling down from its granitic source through the high Culm lands forming the north flanks of Dartmoor, the winding precipitous sides of the valley overlooking its rock-strewn bed, and at Okehampton its waters unite with the westerly stream under leafy bowers, which in autumn dress make charming little pictures of wood and water scenery.

The West Okement plunges from the barren hill-sides of Dartmoor into a thicket, whence it winds round the northern declivity of the moor, past the ruins of Okehampton Castle,

that looks like a rude crag-mass breaking through the crest of a sylvan slope.

The parts of the Exe that belong to the Culm-measure area afford fine scenery in places. In the neighbourhood of Bampton the sides of the valley are often picturesque, steep, and well wooded. To the south of Tiverton the alluvial tract through which the river flows is bounded by high hills with steep slopes, partly wooded. Bickleigh Bridge forms a picturesque object. To the north of Exeter the fine examples of Scotch fir that flourish in the park at Pynes, and on the Duryard estate add no little charm to the view.

The coast scenery of the Culm rocks, though much less broken than that of the Devonian area, is very fine in parts. The bold headland of Hartland Point, 350 feet high, with its precipitous cliffs, affords fine examples of the contortions into which the beds have been thrown. Gallantry Bower (387 feet), and the wood-crowned heights above Clovelly, rise in bold precipitous bluffs from the beach, and overlook the lesser elevations toward Westward Ho! On the beach great masses of grit have here and there resisted the force of wind and tide, and exhibit in their gabled outlines the anticlinal (or saddle-back) structure that is distinctly shown in the beds composing them. Both in the rock reefs and in the cliffs, now forming a low line at the foot of a broken craggy slope, now rising in bold exposures of rock, the constant undulations and contortions in the grits and shales are very noticeable, and their effect is still more marked by the variety of grey tints exhibited by the beds.

The quaint little village of Clovelly, with its narrow pebbled footway winding up the masked cliff, and spanned in one place by an archway through a cottage, is familiar to all who visit the district, as is Westward Ho! a place in which I can detect little of the picturesque, except in the costumes of the golf players, and in the coast rounding Rock Nose.

DARTMOOR.

Picturesque Devon would be very incomplete without Dartmoor: a background majestic when shrouded with the mist of storm clouds; full of the poetry of colour when flushed with the brilliant reflections of a glorious sunset sky; the graceful outline of its slopes falling away from their summit tors, and melting ever and anon into the haze-shrouded valleys, those "scars, the successive bequeathings of ages untold," from which many a sparkling brook descends to gladden the vales below. And then the streams on the

skirts of the moor up which the foliage creeps; how they chafe against the boulders that strew their beds in picturesque confusion, and start away with a leap round the obstruction, like schoolboys leaving their desks for play.

In foreground studies of this sort the Moretonhampstead side of the moor is rich enough; but on the Okehampton side the stream courses are bare of foliage, and rest on their own attractions.

The Taw Valley, when evening is coming on, and the shadows ascend the steep heights of its sides, presents a weird appearance; the stream meanders through a peaty moor from the clefts that descend on either side of a bold round hill to the south, and the valley contracts from this filtering basin into the gorge through which it enters the Culm-measure area toward Belstone.

The tors, at all times striking piles of rock, are full of a weird interest as the sun goes down; but never more than when the luckless wanderer is enveloped in a thick white misty morning haze, rising in a dark shroud from the lower grounds, and sweeping over him as he nears some rocky pinnacle. It was thus that Yes Tor loomed grandly through the haze upon me, like the anvil for the hammer of a Thor, a monument mutilated by the mightier power of that ever recurrent elemental strife that shed its stony spoils around. Divested of mist-magnified outline, the tors in their varying piles are the forms that the harder parts of the granite assumes, in obedience to its joints and cracks, as the outline of its surface is slowly moulded by frost and rain, and running water; and very instructive these structures are. In some tors we have huge tabular masses of granite, like gigantic paving-stones piled upon one another, and sparingly cross-cut by vertical joints. In others the cross joints are numerous, and give the mass a more castellated and less rude appearance. In others again, the blocks are very irregular in thickness, and exhibit a ruder aspect, as on Yes Tor. Where the vertical joints are marked; the divisional horizontal lines being more impersistent, or very slightly marked, the piles, as on Hey Tor, form rude masses, with little or no symptoms of pseudo-stratification. In the Irish granite ranges, Killiney Hill, for instance, although we have a similar beautiful broken outline, the hill tops do not form tors, owing to the absence of joints in directions which would lend themselves to the formation of such a structure.

The rock-strewn sides of the Dartmoor Hills show the

rapid waste of these rocky pinnacles, as they topple over from the unequal wearing away of their pedestals.

De la Beche gives the following heights of some of the principal Dartmoor Tors above the sea (*Op. cit.* pp. 4, 5):

Yes Tor, 2050 feet; Amicombe Hill and Fur Tor, each about 2000 feet; Cawsand Beacon, 1792 feet; Newlake Hill, 1925 feet; Cocks Tor, 1472 feet; Great Mis Tor, 1760 feet; Pen Beacon, 1470 feet; Shell Top, 1600 feet; Three Barrow Tor, 1510 feet; Peter's Stone, 1785 feet; Rippon Tor, 1549 feet; Hamildon Tor, 1738 feet; Butterson, 1203 feet.

I quote the following passage (from a foot-note to p. 4):

"The western frontier of Dartmoor has its otherwise abrupt character in a great measure relieved by Black Down (1160 feet) and Heathfield, on the north of Tavistock, and by Roborough Down, on the south of the same town; Brent Tor (about 1100 feet) on Heathfield, a conspicuous object in the surrounding country, carries the attention from the main mass of Tors which range along the skirts of the Moor."

The granite of Dartmoor covers an area of about 240 square miles. Its outlines, viewed from Hatherleigh Moor or from Haldon, form very picturesque backgrounds.

TRIASSIC AREA.

The area covered by Triassic rocks in Devon, exclusive of those portions which, being exposed in the valleys ramifying the Greensand-table land, cannot be said to have any scenery peculiarly their own, is about 300 square miles in extent. It forms the physical region of least elevation and of greatest fertility. The greatest heights attained by the Triassic rocks are on the margin of the Culm-measure area in the Tiverton and Crediton districts, where they attain heights of more than 800 feet above the sea in places. In a series of such persistent groups and distinctive characters as are those presented by the Devonshire Trias, a contour varying along the longitudinal lines of outcrop is only to be expected. I am precluded from entering minutely into the distinctive features made by the various divisions of the Trias, which more properly belongs to the memoir on the district for which it is reserved. In a general way, the steeper slopes of the Upper Keuper beds and the elevation of the hills, where at all striking, are due to the recession of the Greensand table-land, of which they form the slopes, or occasionally the proximate denuded pedestals. The Keuper sandstones vary in superficial character from low to comparatively high ground. The pebble beds at the base of the Keuper make an escarpment varying

in height and broken and shifted in places by faults, but nevertheless the most marked purely Triassic feature in the area, attaining a height of more than 420 feet at West Down Hill, on the coast. The Middle Trias marls form a broad belt of low-lying country, falling rapidly at first from the pebble bed escarpment westward. The Lower Triassic beds vary much in contour, owing to their variable composition. The sandstone districts attain to less elevation than do those composed of breccia, and the features of the latter afford some degree of similarity to those of the neighbouring Palæozoic districts, though generally on a smaller scale. The Triassic districts, except on the coast-line, seldom exhibit anything that could be denominated bold scenery, but they are none the less picturesque; the ever present red soil throws out the greens of rich grass fields and tree-studded hedges more vividly. The greater fertility of their surroundings gives to the farmsteads more of an air of comfort and prosperity than is usually suggested on the uplands. The neighbourhood of Samford Peverill, and the district from thence by Tiverton to Calverleigh, is pretty, and being not devoid of bold features affords a pleasing diversity of contour. Uffculme, Kentisbeare, and Bradninch, present many attractive features in the valleys breaching the high lands on the Culm-measure margin; in the neighbourhoods of Collumpton and Bradninch many a pretty peep is obtainable. In the broken ground north of Thorverton fine views are to be had; and it is almost labour lost to single out objects of interest in a district over which no extensive view can fail to be pleasing; and any number of such views are presented from the outskirt summits of the Black Downs, and from their outlying fragments, the Haldons.

The inlying Culm-measure hill of Spray Down, with its mantling parti-covering of Trias, exhibits steep hillsides and pleasant woodland shades. Clisthydon is a pretty village, in a fertile spot well studded with trees.

The valley of the Otter affords many objects of interest, and the views from the fault-broken summits of the pebble-bed hills, forming the boundary of its watershed with that of the Exe, are both extensive and attractive, looking either east or westward.

The broken hilly ground between Exeter, Dawlish, Teignmouth, and Cockington affords, perhaps, the most charming scenery in the Triassic area of Devon. The environs of Dunchideock, Kenn, Powderham Park, and more particularly Mamhead, present many attractions, both in foliage and features.

On its coasts the Triassic area presents some really fine scenery. The bold headland of the Ness, the fantastic pinnacles outstanding from the Dawlish cliffs, the noble cliff at Labrador Inn, are all worthy a visit; but in the fine mural crags that bound the combes of Watcombe and of Petitor, like giant walls of solid masonry, we have something not very far removed from the sublime. The red cliffs of the lovely shores of Babbicombe Bay contrast most pleasantly with the grassy slopes above and pale grey limestone beyond. The coasts formed of the upper beds of the Trias east of Exmouth are not nearly so bold, although the high land of Orcombe and West Down Hill make fine cliffs. The Keuper sandstone cliffs are precipitous, and a gnarled and rugged character is imparted to them by the weathering out in relief of fibrous nodular bands of harder calcareous matter, now running in a network through the cliffs, now in numerous parallel lines, affording here an eyry, there a resting-place, to the chattering flocks of sea-birds that hover round, and plunge anon with sudden swoop into the foam-crested billows in search of their finny prey. From their rugged precipitous aspect the sandstone cliffs often seem higher than they are. Seen from below, as I have seen them, tide-bound in a little cove, with the boiling surge deluging the fallen blocks of a Providence-provided breakwater, now threatening to suck one seaward in the breaker's long recoil, now reverberating in a cavern at the foot of cliffs that forbid all hope of succour or ascent; then a rugged precipice of 200 to 300 feet in height, becomes grand, pitiless, majestic,—so much can the expression of Nature's moods stamp varying characters upon her forms. But the sandstone cliffs look quite fine enough from above; and I mention the incident in the hope of deterring any one from attempting a careful investigation of them from below much further than the western promontory of Ladrum Bay, without being well assured of the state of the tides, and more particularly taking care not to let the investigation be so engrossing as to render him oblivious of time and tide.

The Neocomian Area.—The county boundary follows the northernmost extension of this area on the northern summit of the Black Downs. The physical character of the region is so well described in De la Beche's *Report*, that I may be pardoned for transcribing the following extracts: "They" (the Blackdown Hills) "cannot be said to form a range of hills, but rather an elevated table-land cut into, more particularly on the west and south, by deep valleys, which thus divide it into several long lines, chiefly running to the

west, south-west, and south. The longest continuous line of this kind is that which extends from Staple Hill on the north, and runs about 17 miles by Brown Down, Birch Hill, the hill forming the left side of the valley of the Otter, to Honiton, Faraway Hill, on the west of Northleigh, Gittisham Hill, and the hill on the east of Ottery St. Mary, to Beacon Hill, above Harpford, on the Otter. A depression here takes place for about three quarters of a mile, after which Peake Hill and High Peak, near Sidmouth, continue the line to the sea for about two miles and a quarter, so that, including the depression, which is itself upon high ground, this line of high land extends about 20 miles, varying in elevation from about 600 to 750 feet. . . . The cliffs on the coast from the vicinity of Sidmouth to Charmouth vary from 400 to 600 feet in height; Charlton Common, between Lyme Regis and Axmouth, being 582 feet above the level of the sea. The aspect of the higher portion of these hills is somewhat uniform, consisting of a sharp slope of 25° or 30° , for about a third of the height from the summit downwards, after which the slope becomes more gentle. Bold promontories and isolated portions at the termination of the lines of elevated land have, from their commanding positions, been seized upon at different periods for military purposes, and the remains of ancient earthworks or camps are seen in various directions, among which may be noticed Castle Neroche, rising above Curland; Membury Castle, Musbury Castle, Hawksdown, near Axmouth; Sidbury Hill, near Sidmouth; Dumpdon (879 feet above the sea), on the north of Honiton; and Hembury Castle, near Broadhembury.* To these examples the landward remnant of the camp on High Peak, west of Sidmouth, and the entrenchment on Stockland Hill, might be added.

The Greensand table-land is remarkable for the beauty of its valleys; in itself the broad, flat-topped district, with its projecting spurs, appears level and almost devoid of interest; but looking down upon its high land over the rich vale of the Culm and its tributary valleys above Culmstock, near Hemyock and Dunkeswell, numerous plantations clothe the slopes here and there and add a charm to the prospects. The broad and fertile valley of the Otter, opening westward from Honiton, is a very pleasing object, viewed either from Hembury Hill, Combe Raleigh Hill, Gittisham Hill, or Dumpdon Beacon—Dumpdon Beacon, an outlying fragment of the Cretaceous plain, makes a very marked feature amid the undulating Triassic ground from which it rises. Pretty

* *Op. cit.*, pp. 3, 4.

valley scenery is also furnished by the tributaries of the Axe, many points up the Yarty being worthy of attention. Moreover, the Yarty or Stockland Valley is diversified by the bold outlying fragments of the Cretaceous plain which form Shute and Dalwood Hills. Widworthy and Offwell districts present attractive valley scenery. The Liassic rocks in the Chardstock and Membury Valleys being exposed to a much less extent than the Triassic marls, cannot be said to present characteristic features. The Sid Valley and the pretty little valley of Branscombe are attractive.

The landslip below Dowlands Farm, near Axmouth, is very fine, both from its broken character, and as an example of the cataclysms which here and there accelerate the slow wear and tear of rains and frosts. Its dwarf wood and bramble brakes are overlooked by hoary pinnacles of light grey rock, and a masked cliff with contrasting masses of rock peeping through their bush, rank grass, and bramble covering. The exposure of the grey and buff tints of the Greensand, capping the red marl cliffs, adds greatly to the picturesque in the coast scenery; and where the Greensand and its superincumbent chalk constitute the whole cliff, as at Beer Head, the prevailing pale grey tone gives a certain grandeur that is not presented by red cliffs of the same height.

In estimating the area of the Neocomian range we include all the valleys ramifying its table-land, as being an inseparable part of its physical geography. The area of the Black Downs in Devon, from the coast northward, is about 165 square miles, and the combined area of Great and Little Haldon is about five square miles. This elevated plateau once, doubtless, covered nearly the whole Triassic area abutting against the Quantocks on the north, and Dartmoor on the west.

There are two principal attractions in these high Cretaceous lands that we have not alluded to. Namely, as beacons from which extensive views of the whole Triassic area of Devon can be obtained; and as objects of beauty when viewed from other summits than their own. From the Black Downs, on their western margin, the whole breadth of the Triassic area is overlooked; but from Haldon we have the additional advantage of commanding a fine view of Dartmoor, taking in the beautiful broken outline of Hey Tor and its adjacent hills, a background worthy of the charming broken wood-studded country that intervenes. From Haldon again, looking eastward, our background is formed by the long level

outlines of the Black Down range, broken by its projecting spurs, and intersecting valleys, whilst the fertile districts of the Trias at our feet are relieved as they recede by the rising grounds of Woodbury Common and its kindred hills.

When viewed from the Triassic area the Black Down range presents a much greater diversity of outline than could be obtained from points of view of an equal or a greater height; and the outline is very variable from different points of view; in places presenting the character of very depressed peaks, with even gentle slopes falling away on either side, in places affording a long stretch of flat summit, flanked by terraces of less elevation. These appearances are due to the perspective recession of the irregular outline of the table-land, aided to some extent by its gentle undulations; those parts which advance appearing as peaks or flat-topped summits, according as we view them directly or obliquely, and the receding portions of course seem to be of much less elevation.

The Greensand is seldom exposed on the slopes; but to this rule Black Down, north of Broadhembury, forms a notable exception, the pits and grubblings for scythe-stones exposing patches of the pale buff sand here and there on the upper part of the slope; and these exposures catch the fugitive gleams of light with wonderful brilliancy.

The slopes of the Black Downs often present most beautiful contrasts of light and shade, as when their contour is veiled in one of those tender hazy tints that the humid atmosphere of Devon so often imparts to distant objects, and the light from a rifted cloud streams bright on some grassy slope, or kisses the hillside with a subdued beam, whose borders melt away in bluish or in purplish greys.

Pevarstone, on the summit of the Culm-measure hill, near Collumpton, on the south, commands an extensive view overlooking the fertile Triassic district on the east of Spray Down, and bounded by the broken outline of the Greensand hills on the coast, made by Sidmouth Gap and the outlying fragment of High Peak. But this view is limited in comparison to that which opens to us from the summit of Roach Hill, the north-east part of the Culm-measure inlier of Spray Down, above Paradise coppice. From this hill an extensive panorama is spread out on all sides. Beneath us the broad fertile districts of the Trias, parcelled out by tree-studded hedges, and broken by every minor diversity of hill and dale features, are bounded by the irregular outlines of Sidmouth Gap, and the neighbouring summits of the Greensand table-

land, which stretches thence in a long line of background, ever varying in distance with the outlines of its irregular extension, past Broadhembury and the picturesque little outlying knoll of Blackborough, to the northerly limits of the range. Knoll Hill, on which Pevarstone (recently mentioned) is situated, appears like a bold mound, between which and the higher lands of the main area of the Culm-measures, on the opposite side of the Culm valley, we catch a glimpse of the fine tower of Collumpton Church, and far away beyond the boundary of the county northward. On the other side of Roach Hill the view is bounded by the undulating outline of the Culm-measure districts, with their mantling slopes of Lower Trias gravels, broken with contrasts of the red and green of the arable and pasture fields. The Culm-measure hills toward Silvertown exhibit a bold irregular contour, marking the breach of the Exe Valley, and the surrounding high lands. To the south the prominent hill of Killerton Park, with its twin summits, rises from the lower grounds of the surrounding Triassic district, and beyond, the high lands of the Culm-measures on the north of Exeter are distinctly visible. From the heights of the Exeter Culm districts extensive views, taking in the Triassic valley northwards, and embracing the bold prominence of Spray Down and Roach Hill, are obtainable; but with all the attractions of Scotch fir to be had in many of these points of view, the panoramas are rather objects for the eye to feast on than for the painter's art to portray, being too extensive for the rules of perspective, and too universal in interest to afford leading points to attract, and not to weary the eye when transferred to canvas.

The low lands of the Taw estuary, with their sand-hill coast fringe, rich in botanical treasures; the uninteresting flats of Petrockstow, and the broad Bovey Valley, are only of interest in their geological aspect, and as regards area too insignificant to add to or detract from the scenic beauties of the county.

In concluding an outline, necessarily very general, and from the misfortune of being unacquainted with the districts adjoining the Tamar (north of Plymouth) on the east, and of a great part of Dartmoor, necessarily very imperfect; by way of epilogue, I may be allowed to plead extenuating circumstances for having done scant justice to the beauties of the county, a plea which I should not have had to urge to so great an extent if the matter had been extracted from notes made on the spot. But memory must

plead her weakness; as new beauties charm the eye, old scenes grow less familiar, and if on the whole the new has many parts in common with the old, it becomes more difficult to recall those little touches of expression that give so endless a diversity to Nature's face. The peripatetic geologist has no time for art; oftentimes the most beautiful scenery clothes a region that can only be investigated by painful physical and mental toil, and, puzzling the brain, palls on the eye; and a year spent in investigating a large tract in west Somerset can hardly be said to make the impressions of the scenery of Devonshire, gained during a survey extending over several years, more vivid. The foregoing recollections of the beauties of Devon have no pretensions to the ambitious work that Congreve speaks of—

“Hard is the task, and bold the advent'rous flight
Of him who dares in praise of beauty write;
For when to that high theme our thoughts ascend,
’Tis to detract too poorly to commend.”

RIVER OF DART.

BY REV. TREASURER HAWKER, M.A.

(Read at Totnes, July, 1880.)

"River of Dart, O river of Dart,
Every year thou claimest a heart."

SOME years ago I read an interesting sketch in the *Globe* newspaper, entitled Dartland, with the following summing up of the character of the river Dart (I ask my hearers to note the name)—"the daintiest, loveliest, most gentle, and most *pensive* river in the garden of the West.

"We hear of the Rhineland; why not of the Dartland?"

Filled with a lasting gratitude to it for not swallowing me up, self and pony, on a memorable occasion (Sept. 7th, 1863) when fording it after a night of rain, just above Dartmeet, at Baveney; loving it cordially from head to foot, if I may so speak; admiring it in all its various moods and aspects with an unabated enthusiasm, I must enter my protest emphatically against such inappropriate epithets as "gentle and pensive."

Why, the very name of "Dart," like the Otter at Ottery St. Mary, signifies plainly its nature and kind of stream, for at any rate the greatest part of its (nearly) forty miles above the tideway, and its descent of nearly two thousand feet to Totnes Bridge.*

Besides, it has the proud distinction of giving its name to

* Mr. R. N. Worth, in an interesting paper, "Notes on the Historical Connections of Devonshire Place-Names," read at Paignton, says (*Trans. Dev. Ass.*, vol. x., p. 279): "The Dart alone of the larger rivers preserves a name of distinctly Kornu character. It is the same name as Derwent, which Mr. Taylor renders 'clear' water, from 'dur-gwyn.' Dur is the chief Kornu word for water, but 'gwyn' really means 'white,' and the 'white water' is an epithet very fairly descriptive of a stream which tumbles and plashes so continuously around and over the obstructions in its course. The old form of Dartington is Darentun."

the whole moor, "mother of rivers;"* and whatever epithet or praise we may give to Dartmoor, it certainly cannot be called "gentle or pensive." Its chief beauties are exactly the reverse of gentleness or pensiveness.

Carrington, in his poem on the region, far more correctly, addressing Cranmere Pool, says—

"Thine the arrowy Dart,
Fleetest of rivers. Though the desert lifts
Awhile its tors above him, yet he sweeps
Full soon impatient down to vales of bliss."

Perhaps the writer was thinking of the part between the town (Totnes) in which we are assembled and Dartmouth; although even then I do not myself see much pensiveness—a word which one associates with sadness or melancholy—and he does not appear to restrict his description to any one particular portion of the river.

He seems to know something of the river about its source (I say *about*, for one well qualified to give an opinion puts the actual source, not at Cranmere Pool, but at the watershed, two and a half miles north by east of Cuthill); and he has apparently, so to speak, left his card on that grim-looking height, as once, in company with three other moor-lovers, under the guidance of a well-known unerring amateur guide,† the writer of this sketch found there the card of a clerical *alumnus* of Trinity College, Cambridge,‡ in the midst of the most pitiless moor-storm of wind and rain he was ever exposed to, in a six hours' tramp from Bridestowe to Post Bridge.

In vol. xvi. of the *Bath and West of England Journal*, under the article "Peard on Rivers of Devon and Cornwall," there is the following confirmatory notice of the river's source:

"The East Dart, which may be considered the true head, springs from the south slope of Okement Hill, near the source of the Taw; flowing ten miles south-east to its junction with West Dart, it runs thirty miles further till it meets the tide at Totnes."

Another lover of the moor,§ who was well known as a daring rider to hounds over it, almost, considering his straight course through a bog, I might say *per mare, per terram*, has given me his view of the sources of the two streams, the East and West Dart.

* Unless indeed, as Mr. Worth suggests, p. 282 of the paper just quoted, "Dartmoor was the original 'Deuffneynt,' the 'land of deep valleys,' whence we derive Devon."

† John Divett, Esq.

‡ Rev. B. R. Airy.

§ W. F. Collier, Esq.

"East Dart rises on the large (comparatively) flat piece of bog land in which Cranmere Pool, now no longer a pool, is situated. This piece of bog is full of deep cuts or small ravines, in that respect unlike the other large bogs." (I speak of these further on). "Cut Hill," he continues, "I take to be a modern name, derived from Fur Tor cut, a 'pass' apparently cut artificially for the purpose of communicating, possibly for driving cattle from the region of Fur Tor, which is Tavy head, to Dart head through the bog. I do not think Cut Hill is the ancient name or the corruption of an ancient name. East Dart was southerly and the Taw northerly, but a vast flattish highland bog lies between them. West Dart is the larger river of the two; rising from the great bogs south of East Dart head, it has many considerable tributaries, which East Dart has not, *vide* Ordnance Map, not very accurate though. The last time I passed from Fur Tor over the cut to East Dart head I was much struck with the small amount of *life* of any sort that I saw."

To return to myself. It is, I consider, for a single experience, a gain to have seen the surpassing desolation of that most desolate region under the circumstances of a violent, unbroken, sweeping tempest, when the thickness of the mist and driving rain quite hid the cattle from sight, until one nearly stumbled upon them. And such aspects almost seem to suit best the "wild and wondrous" region; certainly they stir the imagination and inspire the poet. The following verses by an eminent judge describe vividly the appearance of the moor and the rolling mists that rise almost suddenly in huge, fantastic shapes, blotting out in a very few minutes all landmarks. Woe, I may say in passing, to the inexperienced tourist, or even native, who is caught by a "Dartmoor vog," and has no compass with him. His only chance then of not wandering round and round, like arguing in a circle, is to follow the first stream or river he can find. The verses I quote are unpublished, though printed—

"Near the Park
Towers up a tract of granite; the huge hills
Bear on their broad flanks right into the mists
Vast sweeps of purple heath and yellow furze.
It is the home of rivers, and the haunt
Of great cloud-armies, borne on ocean blasts,
Out of the wide Atlantic wilderness.
Far-stretching squadrons, with colossal stride
Marching from peak to peak, or lying down
Upon the granite beds that crown the heights.
Yet for the dwellers near them these bleak moors
Have some strange fascination; and I own
That, like a strong man's sweetness, to myself
Pent in the smoky city, worn with toil,
When the sun rends the veil or flames unveiled

Over those wide waste uplands, or when mists
 Fill the great vales like lakes, then break and roll
 Slow lingering up the hills as living things,
 Then do they stir and lift the soul ; and then
 Their colours and their rainbows and their clouds
 And their fierce winds and desolate liberty,
 Seem endless beauty and untold delight."

I am tempted to add a further description from the same poem ; the truth of which may be tested by anyone who will go to Manaton and gaze upon the scene from the rectory—

"They may be seen
 On a great hill, on cloudless summer days,
 Or when the sun in autumn melts the clouds,
 Gazing on that magnificent region, spread
 In majesty below them : teeming plains
 And wood-clothed gorges of the hills in front ;
 Behind them sea-like ridges of bare moor,
 Some in brown shade, some white with blazing light ;
 Above, enormous rocks piled up in play
 By giants ; all around, authentic relics
 Of those drear ages, when half-naked man
 Roamed these dim regions, waging doubtful wars
 With wolves and bears ; and on the horizon's verge
 The pale blue waste of ocean."

That part of the article in the *Globe* of which I have spoken will be agreed to by all who know the district practically, so far as the following account of what has been called "the great Central Morass" is concerned, although really it is too far north to be central : "There is no wilder or lonelier scene in the British Islands than the great morass in the middle of Dartmoor"—one of the largest of the "Dartmoor Stables"—that significant name, which implies accommodation of a certain kind for any number of horses and ponies (the latter not unfrequently do get swallowed up), as the recruiting sergeant told his bumpkin victim, that the bed of glory would hold ten thousand men.

There is, however, no trouble *under foot* in approaching Cuthill, as there are channels to walk in, washed down to the rock ; there are indeed, *me teste*, parts of the bog where there is any amount of half-formed peat ; or, even if full formed, a substance which in moist seasons resembles a kind of gingerbread pulp, decidedly adverse to rapid locomotion, especially by long-legged individuals. What the West of England Compressed Peat Company will do with it in a commercial point of view remains to be proved.

In some of the channels or ravines I have been speaking of, I have seen a tall man entirely hidden by the walls, and

* From *Rhoda : a Devonshire Eclogue*. By Lord Coleridge.

have wished that a farmer friend of mine could have been with me to get, at any rate in part, disabused of his incredulity as to any change of the surface of the earth; for I remember an emphatic member of this Association, a distinguished geologist, saying, at a gathering near Lustleigh Cleave, "On this ground on which we are standing, ladies and gentlemen, there have been at least two miles of superincumbent matter." My yeoman friend stared, and said, "How much?" "Two miles at least." "Don't believe a word of it."

Out of this morass, however, which includes Cranmere Pool, or what was a pool, the Dart, with other sister rivers, takes its rise. Every one who has ever penetrated into the swamp will recognize, as I have said, the accuracy of the following description in the *Globe's* article of its wildness and loneliness—"you might be hundreds of miles from civilization;" and it goes on to depict very truthfully the peculiar features of the surrounding ground: "In the heart of the swamp rises a tall, turf-capped height; and the incessant and merciless torrents of rain have so fiercely rent and furrowed its sides for ages, that its name, beyond the memory of man, has been 'Cuthill.'"

It will be seen that a previous explanation doubts the antiquity of the name. The writer proceeds: "The floods, sweeping down with impetuous force, have reduced the country round to the condition of one vast bog, out of which, like so many natural drain-pipes, spring the rivers that sweep the country towards every point of the compass."

This describes, with the accuracy of an actual observer, the district in which the Dart rises; but here any agreement with the writer—and I have known and fished the upper parts of the Dart, more or less, ever since the days of my youth—ceases.

"Finding the small beginnings of existence here, in the midst of tors that bear to-day the names of the heathen deities to which they were devoted in dim antiquity by the Druids, it makes its way from that ghostly remnant of a primeval forest, Wistman's Wood, through countless gigantic ruins of the type that antiquaries (in despair of a better guess) attribute to the same Druidic authority, to the romantic wall of slate called 'Lover's Leap,' the ivy-grown span of a rocky gorge called Newbridge, and a luxuriant tract of wild, untameable scenery, to the confluence with its twin stream, which is called Dartmeet."

More learned heads than mine have decided emphatically against those convenient "harbours of refuge" for uncertain explorers of antiquity, the Druids, to whom the writer

attributes the names of the tors by which the Dart flows. He speaks also of Wistman's Wood as "a ghostly remnant of a primeval forest." It looks indeed like "an ould, ancient family," as the Irishman said; and Rowe, in his interesting and valuable *Perambulation of Dartmoor*,* has drawn an imaginative picture of its being the last refuge of a Druidical priesthood, something after the fashion of Gray's Welsh Bard, with his "Ruin seize thee, ruthless King;" but one tradition—and perhaps one is as good as another—is, that the wood was planted by Isabella de Fortibus, Countess of Devon and Albemarle, in the 13th century. A good authority on such subjects doubts its having been planted by anyone, and also questions strongly the statement in the *Handbook for Devon and Cornwall* (Murray's) that 700 concentric rings have been counted in the trunk of one of the trees. He tells me that he has a section, taken by permission of the Duchy, a piece 10 × 7 inches, and has difficulty in finding 120 rings not concentric.†

Nor am I sure that the writer knows exactly where Dartmeet is; he speaks as if it was below Newbridge and Lover's Leap. There is a remarkable gorge on the East Dart, about three miles above Post Bridge, above which again the river was substantially walled in, to get, no doubt, draining for tin washing; but there are no "rocky gorges," as he implies, between the source and the point under Brimpts where the East and West Dart meet, giving an obvious name to what many consider the finest spot on the moor. That is saying a great deal; but I am not at all disposed to say that it is not true. For it is very lovely, whether you approach it by fishing down one of the streams, or from the Ashburton Road; the best point of view, perhaps, from its commanding height, as you turn the corner between Yartor and Sharpitor.

More than twenty years have passed since I visited a farm by the East Dart, a short distance above Dartmeet, under Bellever Tor, which belonged to my companion, and was included in the land rented from him. His tenant was a splendid specimen of a moorman, then over seventy years of age, but still erect and above the average stature (he was called the king of the moor), with the fixed hue of health on his intelligent face.

He might quite possibly have been the identical farmer who said to his daughter, after she had paid a visit to Exeter or Plymouth, "Wa-aspl! Why can't-ee zay 'Waps,' like a Christian? I can't abear such methodistical ways."

* pp. 177-8, first edition.

† John Divett, Esq.

For he talked in a quiet, self-possessed sort of way with the old west-country dialect, and in course of conversation said, quite simply :

"I have seven landlords, sir; I rent twenty-five thousand acres of land, and during my whole life I haven't missed Newton market (at least sixteen miles distant) more than four Wednesdays, and always rode a hackney."

Some of this sounded big, if not regal; the explanation, however, was, that he had seven small holdings, and the run of the moor to the extent he said, for cattle—what is locally called a "Newtake;" they are brought up from the lowlands about May, and are kept until October for a trifling sum per head—five shillings—and in a dry season do very well, from the abundance of water and the wide range. And it is an interesting sight to watch the moormen gathering together several hundreds on an autumn day in preparation for their return to their respective owners. A farmer in South Devon told me, that during forty years' experience of such pasturage, he had had only once any difficulty about the recovery of his bullocks; then, he said, "the man who took them in missed two, and he knowed he was bound to find them, and after looking for them all over the moor, he did find them grazing just under Bodmin Gaol."

To return to my old friend, the wild spirit of moor lawlessness cropped out before we left him, for, pointing to a meadow, he said gleefully to his landlord :

"There, sir, that's the greatest improvement I ever made on your property. I took in more than half an acre and made the fence straight;" adding, with half a sigh, "Ah! we can't do that now; Duchy's too strict."

How many similar bits have been filched in former days from the Duchy I cannot say.

Per contra, I am told that latterly the Duchy has had a considerable innings, and has been working vigorously—perhaps a more fitting word would be rigorously—the old legal maxim of "*nullum tempus occurrit regi et ecclesie*," with a new additional reading of "Duchy," a reading in one instance certainly going back as far as the reign of James I., a claim being made, as I understand from one interested in the matter, for a valuable farm sold by the Duchy itself at that date, on the ground that the Duchy had no right to sell. Happily such a monstrous claim was defeated; and now an Act has been passed which applies the royal statute of limitation to the Duchy.

From Dartmeet to New Bridge is a part of the river little

known, I apprehend, to any but sportsmen and fishermen, with its deep pools, "harbours of salmon!" some almost natural baths, so secluded that Dian and her nymphs might sport in them without any fear of intruding Actæons.

It is extremely beautiful, and will amply repay one for the difficult walking; the view looking up as you mount to Holne Cot from New Bridge, with Sharpitor, Lug Tor, Bell Tor on the right, and that grand Tor, Benjay, on the left, is as near an approach to Highland scenery as is to be found in the south.

I am not speaking at random or grandiloquently.

Just after our Ashburton meeting, Mr. King (*clarum et venerabile nomen*), sent a graceful, graphic article, *more suo*, to the *Standard* newspaper, in which he says:

"There is nothing in Devonshire finer than all that upper course of the Dart which extends from Ashburton into the heart of the royal forest, far up towards the sources of the river. It has been compared to Wharfedale, and especially to the valley of the Wharfe about Barden and Bolton Abbey. There is a certain resemblance. Steep wooded hillsides, with ridges of moor and mountain rising distance beyond distance, belong equally to both districts. And yet the points of difference are plainer than those of likeness. Hills and scours of mountain limestone take forms very unlike those of carboniferous dunstone or of granite. The plants and insects vary. The Dart scenery is, on the whole, far more Highland in character than that of Yorkshire, and recalls, perhaps more strongly, parts of the *Lady of the Lake* country."

This portion of the Dart is worth a pilgrimage, even if there was nothing worth seeing between New Bridge and Holne Bridge; whereas indeed there are those glorious Buckland drives, open to the public by the kindness of the proprietor; or, once better still, the Holne Chase bridle paths on the other side of the river. Now, Holne Chase woods having been cut down by the late Sir Bouchier Wrey, Holne Chase has lost much of its beauty in comparison with Buckland; it is chiefly coppice.

Here especially, in the part from New Bridge to Dartmeet, between the resounding hills, is to be heard that peculiar weird-like sound of hill or mountain rivers which the moormen call its "cry," a whisht sort of name, to use a very expressive local term.

It is a sure sign of bad weather, however fair the appearance of the sky. Sir Walter Scott, in his *Lay of the Last Minstrel*, calls it "the voice of the coming storm;" and describes powerfully the effect it has on all who hear it—

"At the sullen, moaning sound,
 The ban-dogs bay and howl;
 And from the turrets round,
 Loud whoops the startled owl.
 In the hall, both squire and knight
 Swore that a storm was near,
 And looked forth to view the night;
 But the night was still and clear."

Mr. Richard J. King—would that we could "call up him that left half told" Dartmoor*—in his article to the *Standard*, after our Ashburton meeting, on "Devonshire Folk Lore," quotes an old moor labourer, saying to his employer:

"'Tis wonderful bright now, maister; but we shall ha' a change. I hear the Broadstones a crying."

The Broadstones are boulders of granite in the bed of the river under the Tor; and when the "cry" of the Dart among them rises sharply in a certain direction a change of weather is known to be close at hand.

The imagination even of an unimaginative moorman might easily construe the mysterious sound as a demand of the river spirit for a victim, and repeat, with a full awe-struck belief, the invocation—

"River of Dart, O river of Dart!
 Every year thou claimest a heart."

or, shorter and fiercer, as if the words of the roaring of the Dart itself—

"Dart, Dart!
 Wants a heart."

But it is not at all improbable that the sudden flooding of the impetuous, not *pensive*, stream, fed by Cherrybrook, Blackabrook, and many other tributaries, does cause many accidents during the year.

In Dartington churchyard there is a tombstone to the memory of John Edmonds, who was drowned in the river on August 17th, 1840. He was driving across Staverton Ford in a cart with a Miss Matthews, and seeing a freshet coming down, attempted to turn back, but the rush was too quick for him, and carried all away. The young woman was found caught in a tree a few hundred yards below; but the body of the man was not recovered for nearly three weeks afterwards, when, it was found near the Dartington Lodge. The horse

* "Mr. King published in 1856, *The Forest of Dartmoor and its Borders*, two essays in introduction to a large work on the history of Devon, which unfortunately was never carried further."—See Obituary Notice, vol. xi., *Trans. Devon. Assoc.*

and cart were washed over the weir, down close to Totnes Bridge.

I have never myself seen the Dart rising with a surprising rapidity to the height, as is said, of seven feet, and rolling onwards with resistless force; but I have seen how, in a very short time after rain, the river

"Down from the hills did raving come,
Cresting each wave with tawny foam,
Like the mane of a chestnut horse."*

There is a semblance of personal power in the river's flooded progress, I can easily believe, which accounts for the curious way in which the moormen speak of it, as something human and living, when they say: "Dart came down last night."

From the point of New Bridge, just under Holne Cot, about which spot the granite ceases, the river will be much better known than its upper stream, and there is no need therefore to say much about it.

A little above Spitchwick entrance may be seen glorious specimens of the *Osmunda regalis*, as high as any I have come across, and just below—happily for the *osmundas*—the Webburn brings down from Vitifer Mine a volume of sadly dirty water, very different from

"The blue rushing of the arrowy Rhone."†

Visitors by hundreds have gazed admiringly upon the fine reach of water from the Lover's Leap in Buckland Drive, where

"The wave again
Is vocal in its wooded walls."‡

Then the railway from Totnes to Ashburton has made tourists well acquainted with the widening river as it glides along under the fair woods of Dartington, sung of by Cardinal Newman in his younger days. Those who wish to see more than can be seen from the railway, pretty as its course is, will, by stopping at Buckfastleigh Station, and walking about two miles, get from Hembury Fort—an interesting spot in itself, with its vallum enclosing seven acres—a lovely view of the Dart below; or they may ascend Cadover Hill, near the spot which Turner chose for his painting of Buckfast Abbey.

Then, not far off, at Dean Prior, Herrick's interment may

* *Lay of the Last Minstrel*, i. 28. † *Childe Harold*, iii. 4.

‡ *In Memoriam*, 19.

be seen duly recorded in the Register ; and the churchyard is close by, where he was buried in 1674.

Notwithstanding, too, his cross lines—

“ Dean Burn, farewell ; I never look to see
Dean, nor thy warty incivility.”

Dean Burn is one of the loveliest bits among the many lovely bits of scenery on the sides of the moor, and worth any trouble, *me judice*, to visit.

Royal middies and fishermen alike—if with different objects—have become familiar with the twelve miles from the wood-clothed hills round Totnes Castle to the rock-bound anchorage at Dartmouth.

It is not for me—among the dwellers in Totnes—to enlarge on the changing, almost unending, succession of beauties in its many windings, nor to say aught of the associations they call up. Byron's lines to the Rhine almost fit this last part of the Dart—

“ The river nobly foams and flows,
The charm of this enchanted ground,
And all its thousand turns disclose
Some fresher beauty varying round.”

Totnes, with its histories and belongings, deserves a separate paper, and an abler pen than mine ; so does its river in its last passage to the sea, if it is to be fitly praised. The writer of the article in the *Globe*, of which I have spoken, enlarges on the beauties of its maturity with an enthusiastic admiration. And at the risk of being grandiloquent, I shall claim for it—*mutatis mutandis*—Denham's well-known eulogy of the Thames—

“ Though deep, yet clear ; though gentle, yet not dull ;
Strong without rage, without o'erflowing full.”

DEVONSHIRE SPEECH THE TRUE CLASSIC ENGLISH.

BY F. T. ELWORTHY,

Member of Council of the Philological Society.

(Read at Totnes, July, 1880.)

THE study of English has to-day a meaning widely different from that conveyed by the same phrase no more than twenty years ago.

In the minds of most people, it then included the common subjects which happened to be taught in the vulgar tongue, such as geography "and the use of the globes," history, arithmetic, with perhaps a smattering of the literature, but hardly ever did it even imply anything like what is now meant by a study of the language itself.

A complete revolution has of late taken place, and, as we all know, it is now fully recognised that a critical study of our own living tongue is as needful a part of a liberal education, as was heretofore the rhythmic composition in dead languages.

This modern discovery, if I may so term it, has caused a flood of light to be poured upon all points whence the origin and growth of English can be best surveyed, and very soon it came to be admitted that not only were the old rigid grammarians and pedantic etymologists quite on the wrong tack, but that the real history of the language was to be found, not more in the books and teaching of the schoolmen, than in the spoken tongue preserved by the country people in the provinces—and which is understood by the name of *Dialect*.

The consequence is that the subject now commands the attention of several classes. On the one hand are those who, taking what may be called a *dilettante* interest, are amused by the fancied barbarisms of the sons of the soil; and among these must be classed most of the gentlemen, past and present, who compose more or less of comedy, in what they are pleased to call dialect. Although I shall allude to this matter further on, I may here state, that most valuable

as many of these compositions are as specimens, yet as a rule they are untrustworthy and misleading to students, from the large mixture they all contain of literaryisms, verbal and grammatical, unknown to the genuine peasant. These literaryisms merely reflect the culture, quite unconsciously to the writer, which in the first place teaches him to appreciate the provincialisms at all, and in the next place leads to his attempt to describe his thoughts in what is generally to an educated man a foreign tongue. The result may be seen almost any week in *Punch*, where the characteristics of perhaps half-a-dozen country sides are jumbled into a literary whole.

On the other hand are those who look upon these very barbarisms as linguistic treasures, wherein is to be found much of the tones, or rather the intonation, the stress on syllables, the pronunciation of both vowel and consonantal sounds, the grammatical forms, and the idiomatic construction of sentences, as they were spoken by our forefathers: as treasures too which still keep alive our old English tongue, while the mere words composing it are constantly changing, and while Board Schools, railways, and book-learning are fast bringing all the language to one dead-level standard of uniformity, such as our ancestors could as little comprehend if they heard it as we are now able to understand what they spoke.

Amongst all the forms of provincial English not one possesses the culminating interest of our own West Country tongue. A good and, I think, a great man, who lived much in it, and loved the county so well that he was always proud to call himself a Devonshire man, said, "Glorious West Country! you must not despise their accent, for it is the remains of a purer and nobler dialect than our own." Well may Charles Kingsley have called *dialect* that which we are now taught to consider as polite English; for verily, modern book-English is but a development, a very dialect of a dialect, the outcome of an accident.

The proof of this is not far to seek. We all know that the English of Alfred's time, or, as it is called, the Anglo-Saxon, is the groundwork upon which our Modern English is built up. But Alfred's own variety was in his day the polite, the courtly, the only recognised literary, in fact, the standard form of speech; and Alfred was, as we all know, a West Country man, speaking in West Country, most likely Devonshire, style.

Now, although there were then as now many spoken

varieties, yet the language of Alfred was the only written form of English until about the year 1100. It is true there had been earlier writers, in the Northumbrian for instance, Cædmon in the seventh century, and Bæda in the eighth, but they were isolated, and their dialect was no longer written in Alfred's time, some 150 years later.

By the beginning of the twelfth century the eventful Norman Conquest had begun to work a great change. French and Latin were the only officially recognised tongues. The native speech was despised as foreign by the rulers, and the more so as it was the language of a conquered down-trodden race. Hence it was left to the boors or churls, and except by a very few monks or scholars it ceased to be written at all. This state of things lasted over 200 years, and the consequence was that the mother tongue of the people fell into a complete state of anarchy, and as a literary language may be said to have virtually ceased to exist. The result was, as might be predicted, some words of ordinary every-day use remained, such as the names of animals and common objects, while words expressive of abstract ideas were soon lost. Thus we see that each of the few and far between writers of English who came after, uses a larger and still larger number of French words, to take the place of the literary terms which had been lost to his native tongue; yet for all this the old speech could not be stamped out nor supplanted. Very many French names for common objects were adopted, like *cider*, *pummy*, *kieve*, *poult*, *lake*, *chimney*, *trumpet*; but the native speech held its own nevertheless, and adapted the foreign words to its own mode of construction and pronunciation, instead of taking the impress of the foreign.

In the following sentence, quoted by Professor Huxley, in his *Crayfish*, every noun is French, while yet in construction it is altogether English: "Partridges, leverets, cockles, and mushrooms are not such bad victuals after all, either for rich or poor, any more than the crayfish out of the river."

This strength of the English tongue, always ready to imbibe and to assimilate foreign words, but all the while retaining its own character, has ever been one of its marked features. We see the same thing going on daily in the words we are now constantly adopting. I heard a man say, not long ago, "Thik abrepos mine nezackly," thus coolly turning a French adverb into an English verb, and supplying it with its proper inflexion. We talk of *posting* our letters, a form of speech our French neighbours could hardly match. So we take Greek and Latin words and compound them to our own fancy, and

forthwith they are veritable English, as telephone, fac-simile, cryptogamic, pantehnicon.

Returning from this little digression, we have to note that, from the date referred to, from about 1100 to the beginning of the fourteenth century, a few monks and others continued to write in their own vernacular, each one in the matter of spelling being a law unto himself, but yet each in his own fashion leaving us a pretty accurate notion of the way he spoke. During all this time we have no known writer of the Northumbrian, or, as it has since been called, the Early Northern dialect, and such works as we have of that period were written in the Midland or in our own Southern.

We may well compare the state of the English at this period with that of the races of India now, except that the latter are far more enlightened, and have a real literature, while our ancestors in the middle ages had almost none. The rulers in both cases foreigners, who, though compelled to learn somewhat of the tongue of the conquered race, yet for the most part despised it, and used it as little as possible. Our Anglo-Indians are teaching native Indians to adopt many of our words, such as *simkin* (champagne), *ishquare* (square), *Becrom* (Abercromby), which are pronounced by them after their own fashion, precisely like the foreign words we are every day importing into England, as *cheffonier*, *beef-eater*, *tambourine*; or, as our neighbours have imported from us, *redingote*, *ros-bif*, *blum-buding*, *jockey*, *tram-vvay*, *édre-don* (eider-down), *boule-dogue*.

Towards the end of the fourteenth century there arose in England two writers whose towering genius was such as to overtop all others, whether speaking the native or the official tongue. These men wrote in the dialect of the Midland provinces, and their power was such as to reassert the dignity of the despised language of the common people. As we have seen, till they arose, English, whether spoken or written, was to the ruling classes a foreign tongue, and was probably as little understood or considered by them as Welsh or Gaelic by the same class now.

These great writers gave an impetus to vernacular literature; so great indeed that the dialect in which they wrote soon became the recognised model of the English language, and henceforth there came up a kind of book-language which, by the help of the printing-press, quickly supplanted all the other forms.

These two men, John Wycliffe and Geoffrey Chaucer, happened to have been born in the Midlands, and of course

wrote in the dialect of their own district. At their day this dialect had diverged materially from the old Mercian, from which it had sprung, and was consequently very widely different from the classical English of Alfred. The effect of Chaucer and Wycliffe upon our modern speech is greatly enhanced by the fact that there was no writer of southern English at all comparable to them, who might have supported our southern form, just at the critical period when the printing-press was bringing about a *renaissance* of our native tongue as a medium for literature; and therefore from that time forward, the language of our great Saxon King was only represented by the spoken words of our West Country forefathers.

Had Chaucer and Wycliffe been but Devonshire men, modern English would have been based upon our southern speech; and in that case it would now have been quite polite to say, "Vor why vore d'ye urn zo vast?"

Thus we see that the modern courtly dialect, now considered to be the correct English, is the descendant of what, in Alfred's time, was, by the then educated classes, held as much below the recognised standard as our West Country talk is now reckoned by dwellers in Park Lane and Belgravia; on the other hand, nevertheless, we have a tongue which, however much it may be contemned, can show a fairer pedigree, and can trace its direct descent from the courtly speech of England's greatest and best Saxon King—Alfred.

It is curious to note, that ever since the revival of letters, there has been a sneering kind of jealousy on the part of the upstart dialect, which has shown itself on all occasions, down to the present day. Whenever an author had to make a stupid, dull clown speak, his *f*'s became *v*'s, and his *s*'s became *z*'s as a matter of course.

It would be absurd to suppose that the South Westerns, whose characteristic pronunciation was thus easily copied, were more stupid than men of the same class elsewhere; yet we find that the custom which had become the fashion in the time of Ben Jonson and Shakspeare, has continued ever since, so that to make a clown *veel* and *zee* and *zay* and *zow* is a regular stage property. It is quite evident that this was so in Ben Jonson's time, for in his *Tale of a Tub* (probably the earliest instance of the use of dialect to mark a character) he shows that he was not really conversant with West Country talk, for he makes one of his characters say, "*O you mun look*" (a north country form) in the same sentence with *zure* and *zin*, which we acknowledge. Again, he speaks of a *varrier*, a word quite foreign to Devonshire lips,

which, in my experience, cannot pronounce French words in *f* except with their proper French initial.

Even in these days of Shakspeare-worship, it is no treason to say, that if he had been familiar with Devonshire speech, he would never have made Edgar, in *King Lear*, say, "Good gentleman, go your gait," in the same sentence in which he uses *zwagger'd*, *poor volk*, and *vortnight*.

These instances may be called samples of literary dialect; a form which all those accustomed to write in the courtly speech are liable to fall into. George Eliot's "Mrs. Poser," and Tennyson's *Northern Farmer*, perhaps the most famous modern literary specimens, are utterly nondescript so far as representing accurately any particular locality. I speak of the first edition of Tennyson's poem; I hear that in the last edition some alterations have been made. It should be noted, as confirming my remarks, that neither of these authors desired to represent stupid characters; on the contrary, both are of the shrewdest type. I feel very little doubt but that the conventional use of West Country brogue for the portrayal of clownish bumpkins, which we have seen has lasted from Ben Jonson and Shakspeare down to *Punch*, had its rise at the time when the Midland dialect first became the adopted medium of literature; how or under what circumstances would be a curious bone for antiquaries to pick.

We have already seen that foreign words are most readily assimilated, and made English, without in any way affecting our grammatical forms, or changing our pronunciation. We can supply them with a home-grown preposition or inflexion, and forthwith they fall naturally into their places.

We talk of *prima facie* evidence, of *bona fide* intention, of a *post-mortem* examination; of *portmanteaus*, *omnibuses*, *indexes*, *pianofortes*, and many more.

It is in its grammar and idiomatic construction that language is most conservative, and hence it is that, though the vocabulary may change, though whole classes of words, like those enumerated by Sir John Bowring in his paper, published in the *Transactions* of this Association (1866), may be lost and forgotten; while new ones, such as I have just instanced, may be daily taking their place, yet the language or dialect practically remains the same. Pronunciation again is another very fixed quantity; and as regards specific sounds, probably the most changeless of all. I have not the slightest doubt that Devonshire men talked of "*tue pair o' butes*" five hundred years ago, and that, in spite of Reform Bills and Board Schools, they will for a very long time to come.

NOTES ON THE SUBMARINE GEOLOGY OF THE ENGLISH CHANNEL OFF THE COAST OF SOUTH DEVON.

BY ARTHUR R. HUNT, M.A., F.G.S.

(Read at Totnes, July, 1880.)

LAST year, at Ilfracombe, I had the pleasure of calling the attention of this Association to the remarkable assemblage of detached stones that strew the bed of the English Channel off the southern headlands of Devonshire. Of these stones I had then seen but three examples; viz., one now in the museum of the Torquay Natural History Society, one forming the doorstep of the Brixham Orphanage, and the third a block buried in the grounds of that Institution. Since my last year's paper was written, through the kindness of Mr. W. M. Baynes, I have come into the possession of several additional specimens of the Salcombe blocks, and of some other interesting stones from the Channel. Each of the Salcombe specimens in my possession, Mr. E. B. Tawney has been good enough to have sliced for the microscope, and has allowed me to append his report of them to the present communication.

The additional stones obtained during the past year, and Mr. Tawney's slices of those suited for examination under the microscope, have so largely added to our knowledge of the submarine geology of the English Channel off the south coast of Devon, that it will be as well to review the whole series brought on shore and examined up to the present time, including those submitted to the Association last summer.

With the exception of the two blocks at the Brixham Orphanage, landed there many years ago, all the stones described by me have been taken by Mr. Baynes' trawler, the *Pelican*; the bearings and position of each stone when taken being noted for me by the skipper, Mr. Bellett, to whom I am greatly indebted for the numerous specimens he has so carefully preserved.

1. The first of the Salcombe stones that came under my own observation is the one now in the Museum at Torquay. It was taken in October, 1878, about fifteen miles south-west of the Start. Its weight is $9\frac{1}{2}$ cwt. It is evidently a granitoid stone, but as it has been kept intact, there has been no opportunity of ascertaining its composition under the microscope.

2. The second stone I saw is the one forming the doorstep of the Brixham Orphanage, where it was landed some years ago. According to the Rev. F. L. Salisbury, it is one of "Old Noll's stones," a local name for the blocks trawled off the Start and Bolt. That it is of marine origin, the fragment supplied me by the Rev. H. Mayo conclusively proves, from the marine organisms present on its original surface. It is a typical granite.

3. The third stone is the one that was landed some years ago at the Brixham Orphanage, spoiled by the masons when preparing it for the foundation of a Mission Chapel, and ultimately, in 1879, buried in the grounds of the Orphanage, to serve as a base for the pole of a clothes-line. From the description of both the Revs. H. Mayo and E. L. Salisbury, this must be a very large block; larger than the one last described, and than another which forms the foundation-stone of St. Peter's Mission Chapel, at Brixham. It is a fine-grained granitoid stone, but there seems to be some doubt whether it is a granite or a gneiss.

4. On the 1st May, 1879, the *Pelican* hauled a large block, about fifteen miles south-west or south-south-west of the Start, while fishing in company with another vessel; it being a common practice for two vessels to tow one trawl when the wind is light. Mr. W. M. Baynes measured this block before it was thrown overboard, and found its dimensions to be 3 feet 6 inches in greatest length, 2 feet 3 inches in greatest breadth, and 1 foot 8 inches in greatest depth. The stone was as much as the united crews could haul. It is an hornblendic granite.

5. On the 13th January, 1880, about twenty miles south-west of the Start, the *Pelican* took a large block, differing widely from all those I had previously seen, as it was not granitoid. The crew were four hours heaving up the trawl, and estimated the weight of the stone at 10 cwt. This block was taken about twenty miles south-west of the Start. Mr. Tawney describes it as a "conglomeratic grit," but it will be seen in his report that "we must consider it a rock not free from alteration."

6. On the 16th January, 1880, about thirteen miles south-west of the Start, another variety of stone was met with in a block of serpentine, weighing some 5 cwt.

7. On the 22nd January, 1880, another granitoid stone was taken, about twenty miles south-west by west of the Start. It weighed about 4 cwt. It is a dark green rock, and is considered by Mr. Tawney to be syenite.

8. On the 5th February, 1880, about twenty-five miles south-west of the Start, another variety of stone was taken in a block of gabbro, weighing some 5 or 6 cwt.

9. On the 15th April, 1880, a well-rounded granitic-looking block, weighing from $\frac{1}{4}$ to $\frac{1}{2}$ cwt., was taken about twenty miles south of the Eddystone. This is the smallest of all the Salcombe stones of which I have seen specimens, and taken at a point more remote from the Start than any of the others; for if the bearings given be correct, the Start must have been at least twenty-eight miles distant. Mr. Tawney considers this to be a metamorphic rock.

10. On the 15th April, 1880, the same haul that brought to light the stone last described (9), brought with it an unrolled fragment of a reddish-brown sandstone, similar in appearance to the Triassic sandstones abundant either in mass or as outliers on the coast of South Devon. The spot where this fragment was brought up was, as has been already stated, about twenty miles south of the Eddystone.

11. On the 28th February, 1880, when about twenty miles south-west of the Eddystone, the *Pelican's* trawl brought up some twenty chalk flints. Three of them were brought to me. The largest of these weighs 6 lbs., is perfectly unrolled, and can never have been exposed to the action of the waves.

12 and 13. On the 7th May, 1880, the *Pelican* took two small stones, about fifteen miles south-west of the Eddystone; one of them (12) being a small flint about 8 oz. in weight, very slightly abraded; the other (13) a small piece of buff-coloured limestone, riddled through and through by molluscs and other marine rock borers.

14 and 14A. On the 2nd June, 1880, two more unrolled flints were taken, about twenty miles south-east of the Start; the bearings, according to Mr. Baynes, who received them from Bellett, being Bolt north-north-east, Start north-east, distant about twenty miles. In this instance both distance and cross bearings being given, and the two being consistent, the assigned position is in all probability fairly accurate. These two flints were taken twenty-five miles from the spot, to the south-westward of the Eddystone, where the flint (11)

was taken, and in the same locality assigned to the conglomerate grit (5) previously described. They weigh 3 lbs. 2 oz. and 2 lbs. 14 oz. respectively.

The collection of stones described above falls naturally into three groups; viz., *The granitoid, metamorphic, and altered rocks, scattered as loose stones on the bed of the Channel, The fragment of unrolled sandstone, and The flints*; but before proceeding to discuss them it will be necessary to consider to what extent the positions assigned to the different stones by the skipper of the *Pelican* can be relied upon. For several reasons these positions must be accepted with great caution. Assuming, as we assuredly may, that the distances and bearings are correct to the best of the knowledge and belief of my informant, we must nevertheless remember that they are taken under considerable difficulties. The distances are but guesses, and the bearings but ordinary compass observations taken, perhaps, whilst the vessel is knocking about in a rough sea at a distance from the land. Cross bearings, to check the accuracy of the estimated distances, can rarely be obtained; but it is satisfactory to observe that in the case of No. 14, when they were forthcoming, they fairly corresponded with the estimated distance. But could we be assured of the accuracy of the localities assigned to the various stones under consideration we should still remain in doubt as to the original positions of these stones at the bottom of the sea. In the case of light pieces, such as the flints, and any small fragments torn off the parent rock *in situ*, these might enter the trawl miles away from the place where they would be lifted to the surface, for the fishing vessels tow their trawls for many hours consecutively, never less than one tide if it can be so arranged. In the case of the heavy blocks off the Start and Bolt, their weight precludes the possibility of their being dragged for any distance in the nets. These move in a different way. We have seen, in the case of the block No. 5, that the crew were four hours in heaving up the trawl. During this time, if coincident with a continuous ebb or flood tide, the trawler, stone and all, would be drifted a long way from the stone's original position, and the place where it would be hauled on board would give but a slight clue to the spot where it first entered the net. Now, though the crew of the *Pelican* succeeded in getting this particular block on board, neither they or their brother-fishermen are always so successful. The stones often break through the nets when the attempt is made to lift them out of the water, or they have to be cut away, owing to the inability of the crews to

secure them. From this fact it follows that if two stones lying side by side happen to be taken by two trawlers at the commencement of an ebb and flood respectively, and both break away at the end of four hours, driving with the tide during the process of hauling, they will ultimately be deposited at a distance from each other represented by the number of miles a vessel will drive with the tide during eight hours. This is, of course, an exceptional case; for it would often happen that the tide would change during the process of hauling, and the stone and vessel be carried back to the neighbourhood of its original position.

It will be seen at once, that whatever conclusions may be arrived at from the fact that off a certain part of the Devonshire coast a vast number of loose rocks are congregated, we can draw no conclusions from, and found no arguments on, the precise locality from which any such stone may be drawn from the sea.

We shall now proceed to discuss the collection of stones before us in the order already named, commencing with,

1. *The granitoid, metamorphic, and altered rocks scattered as loose stones on the bed of the Channel.* Of these, including the block at Torquay, nine specimens have been brought on shore and examined. With the exception of the Torquay block, they have all been sliced for the microscope, and reported on by my friend, Mr. E. B. Tawney. Among the eight so examined there are no duplicates; we have in them eight different rocks. As will be seen, they consist of the following varieties: typical granite; a fine-grained granitic rock, referred to the gneiss group; hornblendic granite; conglomeratic grit not free from alteration; serpentine; syenite; typical gabbro; and a granitoid rock believed to be metamorphic.

The question at once arises, Whence came all these different rocks? And that it is a question which is considerably more involved than it was last year, when we were in possession of but two varieties of stones from the Salcombe grounds, there can be no doubt. In my paper last year on the block now at Torquay, I drew attention to the fact that the presence of the Salcombe blocks could be accounted for on one of four hypotheses: (1) The wreck of a vessel laden or ballasted with granite; (2) ice from the neighbouring land; (3) floating ice; (4) the existence of granite *in situ* on the Salcombe ground. In his paper on "The Metamorphosis of the Rocks extending from Hope Cove to Start Bay," Mr. Pengelly concurred with me in questioning the possibility that such large

blocks could ever be used for ballast, and he further conclusively proved that the Torquay block could never have been "exported by any granite merchant, whether in Britain or the Channel Islands, since it can never have been as much as *rough-hewn* or even quarried." Mr. Pengelly further agreed with me in dismissing the hypothesis of transportation by land ice, owing to the absence of similar blocks between Dartmoor and the sea. If these two hypotheses were untenable last year, still more are they so now. Instead of a ship laden with granite, the wreck hypothesis would demand a ship or ships laden with the heterogeneous rocks I have just described; and, instead of refuting the land ice hypothesis by pointing out the absence of travelled blocks of granitoid rocks between Dartmoor and the sea, we can go further and say, that it remains to be shown that there is any locality in Britain, above water, from which the typical granite, No. 2, and the hornblendic granite, No. 4, from the Salcombe fishing grounds, can have been derived. Writing to me on the subject, Mr. Tawney informed me that he knows of no such locality. For the solution of the problem of the origin of the Salcombe stones, we are reduced to the two remaining hypotheses; viz., that the stones were brought to their position off the coast of Devon by floating ice, or that they represent a submarine area of granitoid, metamorphic, and altered rocks beneath the waters of the English Channel. On the one hand, it may be contended that the rocks are in some cases much rounded, though now lying at rest forty fathoms deep; that they are admittedly lying detached at the bottom of the channel; that no two stones as yet brought on shore have been alike; that erratic blocks are known to exist further up Channel, on the coast of Sussex, and that these facts favour the hypothesis that the collection of heterogeneous rocks found off the Start and Bolt, have been transported thither and are not *in situ*. On the other hand, it may be maintained that though some of the rocks be rounded, though lying now in quiet waters, that the present area of the Channel has in past times been debateable ground between land and sea, having been lost and gained on either side once at least, and that under such conditions the blocks may well have been exposed for a time to the action of the waves. Further, that if the stones were lying detached on the bottom of the Channel, it is an ordinary phenomenon to see weathered blocks lying on any subaerial granitoid area; that, if no two stones hitherto examined have proved identical, that the area from which they have been derived is apparently a very extensive one,

and that if it should be proved that the Salcombe granites differ from those of Devon and Cornwall, that the exposures of granite in those counties are at a considerable distance from the assumed submarine area off Salcombe. Perhaps, however, the strongest argument in favour of the existence of granitoid and metamorphic rocks *in situ* off the south coast of Devon, is derived from the fact that the nearest visible subaerial rocks are the gneiss of the Eddystone on the north-east, and the metamorphic rocks of the Bolt and Start on the north-west; and that not one of the supposed erratics are other than such granitoid and metamorphic and altered rocks as cannot be considered out of place in the neighbourhood of the rocks of the Eddystone and the Bolt. Indeed, as long ago as 1867, the late Mr. J. Beete Jukes expressed his belief in the existence of granite southward of the Bolt district. The following are his own words: "I should be inclined to suspect that a boss of granite may be approaching the surface in this region, and perhaps reaches it under the sea in the adjacent parts of the Channel."*

The Sandstone to the south-westward of the Eddystone. If the fragment of Sandstone be a piece of Triassic Sandstone torn off from submarine rocks *in situ*, we have in it evidence of the presence of the Red Sandstones of South Devon further south than they have hitherto been noticed. Whether the fragment from off the Eddystone indicates an outlier or not cannot be known, as there are no means of ascertaining whether the Trias is or is not continuous beneath the sea from Torbay to the spot where No. 10 was torn off its parent rock. The fragment under discussion seems to have all the character of a piece forcibly detached from a submarine shelfy rock, and that it was so detached was fully believed by Bellett, the skipper of the *Pelican*.

The Flints from the south-westward of the Eddystone. The abundance of flints, more or less rolled, on the beaches of South Devon, has long been a subject of interest to geologists, and various opinions have been held as to their source, whether that source is to the eastward of their present positions, where Cretaceous rocks are known to exist, or to the westward where no such rocks are known, and if present, are concealed by the waters of the English Channel. In the year 1867, Mr. Pengelly concluded his presidential address to the Devonshire Association with a list of some of the unsolved problems of Devonshire geology.

One of these problems was, the origin of the flints on the

* *Notes on parts of Devon and Cornwall*, p. 15.

existing beaches.* In a paper read to the Association by the same author in 1871, he maintained the probability of the beach flints having been derived from submarine outliers, and in favour of this hypothesis he adduced evidence in proof that the Skerries Shoal in Start Bay is composed of "gravel identical with that on Slapton Strand," and that off the Dodman Point, in Cornwall, there is a bank called by the trawlers "No Rest," owing to their nets getting loaded with flint gravel, and having often to be lifted to the surface.†

Mr. Pengelly's suggestion of the probable existence of submarine outliers of flints would account for the existence of such flints on the beaches eastward of such submarine accumulations; but unless the outliers consisted of unrolled flints, which does not seem to be the case with the Skerries Shoal, the ultimate origin of the flints would still remain an unsolved problem, and the difficulty removed but a single stage.

For some years past, with the view of solving the problem propounded by Mr. Pengelly, I have been in search of satisfactory evidence of the existence of unrolled flints beneath the waters of the English Channel.

In July, 1871, Samuel Stockman, an old Brixham fisherman, informed me that about thirty miles south-east of Berry Head he had taken hundreds of flints, three, four, and five pounds in weight, and had often had to take up the trawl on account of them. The flints he described as equal in size to the two fists. This statement of Stockman is borne out by the Admiralty Chart, which gives the bottom as sand and gravel at a point twenty-six miles south-south-east of Berry Head. But assuming that Stockman's statement is correct, and that flints exist thirty miles south-east of Berry Head, they are too far to the eastward to affect our Devonshire beaches.

In March of the present year, 1880, Mr. W. M. Baynes, as I have already stated, sent me three unrolled flints which the *Pelican* had taken, with others, on the 11th February, about twenty miles south-east of the Eddystone. On the 26th April, Mr. Baynes took me in his yacht to Brixham to see a piece of cannel coal that had been taken by the *Promise*, trawler, south of the Wolf, which piece, I may say in passing, was just such a piece as may have formed part of the cargo of a coal-laden vessel. Whilst at anchor outside the harbour the skipper of the *Pelican* came alongside, and I took the opportunity to make some enquiries as to the flints he had taken off the

* *Trans. Devon. Assoc.*, vol. ii. p. 37.

† *Ibid.*, vol. iv. p. 205.

Eddystone, and as to the flints of "No Rest." He told me that "No Rest" derives its name from the fact that the fishermen cannot trawl there for more than three hours without having to haul up, that the obstructions were flints and pinnas, which latter cut the nets, and that he thought the flints were rounded. I reminded him that the flints he had sent me from south of the Eddystone were not rolled, and told him that I wished to find out if those from "No Rest" were so or not. His reply was instructive. "Oh, I think I can explain that; the flints from 'No Rest' get much turmoiled about by the trawls, but when we got the others we were quite out of our latitude from fog." Now, however mistaken Bellett may have been in supposing that the trawls would account for the flints being rounded, his answers show us what a vast amount of flints must be hauled by the trawlers for such an idea to have entered his head at all. Bellett being then about to start for the Plymouth fishing grounds, I enjoined him to get me some flints from "No Rest" as soon as he could. On May the 8th I received the following letter from Mr. Baynes: "I send you two stones taken yesterday not very far from 'No Rest,' by the *Pelican*, the Eddystone bearing about north-east, distant about fifteen miles." These were the two stones, No. 12 and 13, the small flint and the buff-coloured limestone. The spot whence these flints were taken is described as "not very far from 'No Rest;'" but as a locality fifteen miles south-west of the Eddystone can scarcely be described as "off the Dodman Point," the bank called "No Rest" alluded to by Mr. Pengelly can scarcely be the same as the one to which reference is here made by Mr. Baynes on the authority of Bellett. On the 2nd June, as already stated, the *Pelican* took the two perfectly unrolled or abraded flints, Nos. 14 and 14A, about twenty miles south-east of the Start, and about twenty-five miles from the place where the first lot was taken, south-west of the Eddystone.

We have thus before us, in the specimen produced, evidence that unrolled flints have been taken at three different places in the Channel. We have it on good authority that vast quantities of flints occur off the Dodman, and I see no reason to doubt Stockman's statement that they are found thirty miles south-east of Berry Head. With respect to the spot off the Dodman, and that described by Stockman, we can say nothing as to the character of the flints; but their abundance appears unquestionable. The specimens from south-west of the Start and Eddystone are, however, sufficient proof of the existence of Cretaceous deposits in the Channel,

if we can be sure they have not been derived from cargo or ballast. It may be difficult in this case to prove the contrary, but the ballast hypothesis in this case seems an untenable one. Our unrolled flints from such widely-separated localities can scarcely have been derived from one wreck; several wrecks would be required to account for them, and no amount of wrecks would account for the vast quantity of flints that so inconvenience the fishermen at "No Rest." Further, ships obtain their ballast from the nearest available source of supply, and it is evident that the rolled flints of the sea beaches would be oftener obtainable than fresh flints from chalk quarries. The fact then that the flints are unworn goes some way to show that they have never been used as ballast. It has been suggested to me that these flints may have formed part of ballast thrown overboard by vessels on nearing port. This suggestion does not meet the difficulty as to the unworn character of the flints taken by the *Pelican*, nor does it account for the vast accumulation of flints at "No Rest." If, however, these flints were never either cargo or ballast, we have in them good evidence of the existence in past time, if not now, of chalk rock to the south-westward of the Start, and even of the Eddystone, and in a position whence the flints on our Devonshire beaches might formerly have been derived during past oscillations of the sea and land levels. It may perhaps be objected that the unrolled character of the flints is inconsistent with the rolled character of the Salcombe stones discussed in the earlier part of the present paper. This inconsistency is, however, more apparent than real; for, assuming the existence of chalk after the land had sunk sufficiently to place it out of reach of the action of the waves, the attacks of marine borers, with perhaps the chemical action of carbonic acid in the sea-water, would slowly but surely remove the chalk, and leave the enclosed flints intact.

P.S.—Since the above paper was read Mr. W. Whitaker, F.G.S., has informed me that unrolled chalk flints, more or less covered by shells of *Balan*i, &c., occur in the "coprolite-bed" at the base of the Red Crag in Suffolk, where the crag rests on the London clay, and is about ten miles horizontally distant from the outcrop of the chalk from beneath the Eocene Tertiary beds. From this it would appear that the unrolled condition of a flint is not conclusive evidence that it has not travelled.—A. R. H.

NOTES OF MICROSCOPIC EXAMINATION OF NINE SPECIMENS OF ROCKS FROM THE SALCOMBE FISHING GROUNDS.

BY E. B. TAWNEY, M.A., F.G.S.

2. Doorstep of Brixham Orphanage, a granite of moderately coarse grain and pinkish colour, with large pale flesh-coloured orthoclase twins, dark and silvery mica.

Microscopic examination reveals nothing more of importance; the biotite and muscovite seem in about equal proportions; the orthoclase is largely predominant, but some plagioclase is present, and little crystals of it seem enclosed in the orthoclase, both in fairly fresh condition. The quartz contains cavities—some with moving bubbles; also microlite needles, and hairlike delicate crystals of undetermined nature. Some apatite is present.

3. Salcombe block, buried at Brixham Orphanage, a rather fine-grained granite-looking rock, in which a certain streaky arrangement of the mica is apparent, the feldspars fresh and translucent.

The thin slice shows the micas distinctly set in one direction mainly; they wrap round the feldspars, or larger quartzes, being often accompanied in this by the finer portions of the ground which exist between the larger constituents; from this arrangement we are inclined to refer the rock to the gneiss group. The feldspars show little or no kaolinisation; orthoclase more abundant than plagioclase. Both biotite and muscovite are present, developed between the larger crystals, and with distinct alinement. The quartz contains numerous delicate long capillary crystals, and cavities with bubbles. Apatite is present.

4. Hornblende granite, a rounded block, fifteen miles south-west of Start Point; a coarse-grained rock, exhibiting colourless feldspar and quartz, black hornblende and brown mica.

The microscope shows hornblende and biotite with their characteristic features abundantly present. Of the feldspars, orthoclase and plagioclase seem in almost equal proportions; both are much decomposed and kaolinised in patches, the portions left untouched depolarise brightly. The quartz contains a quantity of hairlike crystals of undetermined nature, besides these are a few prismatic microlites, and enclosure of minute cavities. Apatite is well developed also.

5. Conglomeratic grit, from a sub-angular block, dredged twenty miles south-west of Start Point; a coarse grit containing a few pebbles of rolled vein quartz, flesh-coloured feldspar, and fragments of fine-grained felsite-like rock.

Microscopic examination shows that the quartz grains, of which it is mainly composed, have mostly distinct, and sometimes rounded outlines filled in between with aluminous matter; in some cases,

what seems to the eye a single grain, with definitely circumscribed borders, is seen by polarised light to be so complex, containing both larger quartz and finer mosaic of the same, that it is evidently a portion derived from a pre-existing altered rock. We believe that the orthoclase fragments in the slice are derived, and not formed in the rock; a fragment of microcline was also found. The aluminous matter filling in the interstices between these derived grains would seem to have been derived from decomposing feldspars, so that the rock has much the appearance of an arkose, but apparently of great antiquity. There appears to have been occasional fusion of contiguous quartz grains, so that we must consider it a rock not free from alteration.

6. Serpentine, from a block with smoothed surface, dredged about thirteen miles south-south-west of Start Point; it is of a mottled red and green colour, with steatite veins, and precisely like some of the Cornish varieties.

The microscope shows that none of the olivine is left unchanged in the meshes; in the serpentine are abundance of scattered hæmatite blotches. Veins of chrysolite, or steatite, have a central line of black iron oxide bordered often with red. Some of the enstatite is left unchanged, but only in fragments in the middle of bundles of talcose crystals and steatite, to which it seems to give rise by decomposition.

7. Syenite (?) shows an angular rusty-coloured surface; dredged about twenty miles south-west by west of Start Point; a dark green rock of coarse grain, feldspars opaque, tinted with pale green, and mixed with black hornblende in about equal proportions.

Microscopic examination shows the feldspars so much decomposed that they are not individually determinable; many are certainly plagioclase from indications of multiple twinning, others do not exhibit any of their original features; which is predominant is uncertain, and therefore whether the rock should be classed as syenite or diorite is left unsettled; but as there is a considerable amount of quartz present, it may provisionally be placed with the more acid type; it is certainly of igneous origin. Of the quartz much is certainly secondary; it is seen replacing portions of feldspar crystals, and originating from their decomposition. The hornblende is green in colour, with characteristic cleavage and optical characters; by decomposition it gives rise to chloritic matter, with which some epidote is mixed; epidote may also be seen in the decomposed feldspars. Apatite crystals are large, and specially abundant near the hornblende. Ilmenite is also present.

8. Gabbro, a well-rounded block, dredged about twenty-five miles south-west of Start Point, overgrown with serpulæ, &c.; a coarse-grained rock consisting of white opaque feldspar crystals, and yellowish grey diallage; a typical coarse gabbro.

Microscopic examination shows no other constituents; the feldspar is almost entirely decomposed, scarcely showing original

optical features. The diallage at borders sometimes undergoes a change into actinolite.

9. Dredged twenty miles south of the Eddystone, part of a well-rounded block, speckled with abundance of colourless quartz felspar, mixed with dark green chloritic and hornblendic matter, obscurely disposed in streaks. I believe this to be a metamorphic rock; though the same minerals occur as in No. 7, it differs by the abundance of quartz, the substitution mostly of chlorite for hornblende, and the obscure linear arrangement of the same.

Microscopic examination reveals no other constituent except apatite, which is chiefly connected with the chloritoid patches and epidote. The hornblende is in a minority compared to the chloritic mineral, which, as well as the epidote, may have originated by its decomposition. The felspars are so decomposed that their relative proportions are not determinable, indications of polysynthetic twinning are sometimes preserved, but probably orthoclase may be in excess. The quartz centres are not simple, but consist of a mosaic of interlocking crystals. From the arrangement of the constituents it is referred to the metamorphic series with some doubt.

NOTES ON BOULDERS AND SCRATCHED STONES IN SOUTH DEVON.

PART III.

BY W. PENGELLY, F.R.S., F.G.S., ETC.

(Read at Totnes, July, 1880.)

Prefatory. Though some of the blocks to be described in the present paper may not be strictly entitled to the name of *Boulders*, and though none of them can be said to be *Scratched*, I have, as a matter of convenience, retained the title used in in PARTS I. and II. (*Trans. Devon. Assoc.*, vii. 154; ix. 177.)

I. THE GRANITOID BOULDERS ON THE STRAND BETWEEN THE START AND PRAWLE POINTS, SOUTH DEVON.

On 25th July, 1865, Mr. W. Vicary and I observed two granitoid boulders on the strand, between the Start and Prawle Points. I made on the spot a memorandum respecting them, to the effect that they were well-rounded, and totally dissimilar to any rock *in situ* in the district; that the larger measured $36 \times 36 \times 16$ inches, and contained a considerable amount of granular schorl; and that the smaller one was nearly as large, of finer grain, and not schorlaceous. On 29th July, 1877, I found both blocks occupying, so far as I could judge, the precise spots in which I had first seen them.

The largest of these blocks cannot weigh less than 75 ton. Their rounded forms may have been acquired since their lodgement on their present sites, as they must be exposed to the action of the waves during at least every spring-tide storm. It is not improbable that the masses themselves may have been derived from submarine granitoid rocks *in situ*, at no great distance. (See *Trans. Devon. Assoc.*, xi. 330-331.)

II. THE BLOCK OF "GREENSTONE" IN THE VILLAGE OF KINGSTON, SOUTH DEVON.

Whilst passing through the straggling village of Kingston, nearly three miles, as the crow flies, S.S.W. from Modbury, South Devon, on 28th September, 1877, I observed in the highway, very near a gateway leading to an adjacent dwelling-house, a "Greenstone" boulder, irregularly spindle-shaped, and measuring $4 \times 2 \times 2$ feet, and therefore weighing upwards of a ton. A woman, living in a cottage directly opposite the stone, told me that she was 40 years old, that the block had always been there within her time, that she had never heard any statement or speculation as to how it came there, that there was no story or legend connected with it so far as she knew, that it had no name, and that it was not used as a "lifting block" or in any other way.

There is a mass of Greenstone figured on the map of the Geological Survey, about 2.6 miles long and .6 mile in breadth, having its longest axis in an E. and W. direction, and extending from due north of Aveton Giffard to a point about a mile W.N.W. of Kingston, where it makes its nearest approach to the village.

III. THE BLOCKS OF QUARTZITE IN THE PARISHES OF DIPTFORD AND MORLEIGH, SOUTH DEVON.

On 27th March, 1879, Mr. Paige-Browne, of Great Englebourne, near Totnes, to whom, at different times, I have been much indebted for directing my attention to Boulders and Scratched Stones in South Devon (see *Trans. Devon. Assoc.*, vii. 158-161, ix. 178-183), wrote informing me that in a retired vale in the parish of Diptford he had recently found a "Clatter" of large stones, apparently quartzose, about two or three feet across, lying on moorish soil, and quite unlike the slaty rocks of the neighbourhood. They were very hard, and were being broken up for the roads.

He was so good, at the same time, as to invite me to visit the blocks with him, but engagements prevented for some months an arrangement being made for that purpose. On 3rd October, however, we proceeded to the immediate neighbourhood of Cleve Farm-house, where Mr. Paige-Brown had observed the Clatter. Measured as the crow flies, the house is about 2.5 miles S.S.E. from Diptford Village, or "Church-town," and about 5 miles S.W. from Totnes. Adjacent to it, and on the north side, is an orchard; and on the north of

that, a piece of waste marshy land bounded on the west by a small nameless stream, which divides it from a small wood or copse, and on the east by a parish road. This patch of marshy land, measuring not more than 100 feet from east to west, slopes for about 300 feet towards the north, where it enters a transverse valley, through which another small stream flows. On this waste land were the stones we had gone to see. They extended, from the orchard hedge, almost, but not quite, to the transverse valley; were half buried in the soil; and it was obvious, from the number of large recent-looking pits which presented themselves, that many had been removed within a few weeks. Indeed, my companion assured me that we had reason to congratulate ourselves that our visit had been no longer delayed, as the Clatter had greatly diminished since he first observed it, a few months before. Nevertheless, there was still a crowd of blocks, all of very fine-grained compact quartzite, of a light grey or drab colour, many of them having quartz veins, and all utterly unlike the slaty rocks of the district. Most of them were sub-angular; some, almost perfectly angular; whilst one was pretty well rounded. One, of ordinary size, measured 3 feet \times 2.5 feet \times 2.5 feet, whilst another, perhaps the largest of the series, was 5 feet \times 2.5 feet \times 2.5 feet; the smaller of the two must have weighed upwards of a ton; and the larger fully two tons. There were no such blocks in either of the small streams already mentioned, but their beds were in places covered with small stones derived undoubtedly from the same parent rock, and none of them more than 3 to 4 inches in length.

Soon after commencing our inspection we were fortunately joined by Mr. S. Jackson, of Cleve, whose local observations and knowledge were of very great value to us. He stated that within the last five years many scores of cartloads had been taken for road repairs out of the piece of waste ground on which we were standing; and he was of opinion that the same practice had obtained long before his time. We had observed, moreover, that corresponding blocks had been largely used in building rough walls and fences in the district.

Mr. Jackson having informed us that crowds of precisely similar blocks existed in various parts of the neighbourhood, and that a bed of rock of the same character was to be seen *in situ* in a quarry on Hannamoors, in the adjacent parish of Morleigh, we gladly availed ourselves of his kind offer to be our guide in a tour of inspection.

Blocks proved to be very numerous in the orchard at

Cleve, already mentioned; and Mr. Jackson stated that his experience led him to suspect that in all the localities there were many more than were visible, as they were frequently met with completely buried in the soil, and about a foot below its surface. He added that he had never seen a specimen in the wood or copse immediately on the west, or, indeed, anywhere on that side of the small stream which divided it from the orchard and the waste land.

In an orchard on the New well, or Newell, or Newill estate—about ½ mile towards the S.E.—they proved to be as abundant as at Cleve, and our guide stated that they were formerly quite as plentiful in an adjacent field on the Farleigh estate, but that the ground had been completely cleared. In a copse on the Farleigh grounds, and on the edge of a small stream, we saw a block in the form of a rectangular parallelepiped, measuring 8·5 feet \times 5 feet \times 2·5 feet, thus containing upwards of 100 cubic feet, and weighing not less than 7·5 tons. This was the largest mass we saw, but Mr. Jackson was of opinion that he had noted a larger one elsewhere.

On Hannamoors, in the parish of Morleigh, blocks were very abundant, and many of them of considerable size.

From Cleve we had been continuously ascending, but not at a high gradient anywhere. At the highest, that is, the southernmost, point of Hannamoors there is a quarry, in which, interbedded conformably with the ordinary soft slaty Devonian rocks of the district, there is a bed of quartzite, identical in character with the travelled blocks we had been studying, and of which it is no doubt the parent.

This quarry is adjacent to the high road passing westward through the villages of Halwell and Morleigh to the town of Modbury, and occupying the crest of the hill on the northern slope of which all the blocks we had seen during the day were lying. We crossed this road a few yards west of the turnpike gate about half a mile west of the village of Morleigh (see Ordnance Map), and almost immediately entered a quarry on the southern slope of the hill, where we found another exposure of the quartzite bed. Indeed, both quarries are worked to obtain the quartzite for the roads. The bed dips about 30° towards true S.E. nearly.

Mr. Jackson informed us that, so far as he had observed, the travelled blocks of quartzite existed only on the northern slope of the hill; that they formed two parallel trains extending northwards, from near the ridge of the hill, along the distinct secondary valleys of Newell and Cleve; that

there were none on the minor north and south ridge which divided the said valleys; that the Cleve, that is, the western, train was the longer, and reached the lower level; and that, measured as the crow flies, the Cleve train was about .5 mile long.

There can be no doubt that the blocks had been transported from south to north, and from higher to lower ground. The gradient, however, is very slight; and, as almost all the blocks are very angular as well as large, it is difficult to suppose that their transportation was the result of nothing more than running water.

Should blocks be also found on the southern slope of the hill, they would not necessitate any further modification of the foregoing conclusions than the substitution of the words "both northwards and southwards" for the words "from south to north" in line 7 on this page.

None of the blocks we saw bore any scratches or traces of polish.

IV. THE BLOCK OF "GREENSTONE" NEAR DIPTFORD COURT, SOUTH DEVON.

Whilst passing through the parish of Diptford, on 3rd October, 1879, Mr. Paige-Brown and I observed, by the roadside, near Diptford Court, about 5 miles, as the crow flies, S.W. from Totnes, a rounded block of "Greenstone." It measured 4.25 feet \times 2.5 feet \times 2.5 feet, and hence contained nearly a cubic yard of stone, and must have weighed fully 1.75 ton. It was without traces of polish or scratches.

We had previously, and within the same hour, visited a quarry in a mass of igneous rock coloured as Greenstone in the Map of the Geological Survey. This mass is represented as extending nearly east and west for a distance of 1.7 mile, and having a maximum breadth of .25 mile. The boulder, apparently of the same kind of rock, was upwards of .5 mile due north from the nearest point of this mass. The map, however, indicates another but smaller mass of Greenstone, about the same distance north of the boulder.

V. THE LIMESTONE BLOCK IN THE PARISH OF STOKE-IN-TEIGN- HEAD, SOUTH DEVON.

Having been informed by Dr. Midgley Cash, of Torquay, that he had observed a large stone in the parish of Stoke-in-Teign-head, and near the road from Torquay to Teignmouth, I proceeded to the spot according to his direction, and had

little or no difficulty in finding it. The block is a mass of limestone, lying on the road to Upper Gable, about sixty paces west of the Torquay and Teignmouth road, and is, apparently, used as a step by persons passing over the southern hedge into the adjacent field.

It may be described as wedge-shaped, with the angles and edges rounded. Each triangular face measures 3 feet \times 3 feet \times 1.75 foot, whilst the depth or thickness is 1.5 foot; so that it contains about 3.75 cubic feet, and weighs about 700 lbs., taking the specific gravity at 2.95. (See *Ency. Brit.*, 8th ed. 1856, xii. 88.)

The extensive limestone quarries of Barton and Lummaton, in the parish of St. Mary Church, not more, as the crow flies, than 1.25 mile towards S.S.W., cause one to feel very sceptical as to the claims of this mass to the dignity of an Erratic Block. Nevertheless, it appears desirable to record its existence.

VI. THE "WHITAKERS" IN THE PARISH OF TAMERTON FOLIOT, SOUTH DEVON.

In the spring of the present year (1880), Mr. F. E. Fox, B.A., F.R.G.S., informed me that numerous blocks of rock, locally termed "Whitakers," some of them of very great size, existed in various places on and near his property, at Uplands, in the parish of Tamerton Foliot, in the south-western corner of Devonshire.

The term "Whitaker" was familiar to me, as I had frequently heard it applied by farm labourers to small pieces of quartz, about Torquay. It is also used about Ashburton; and Mr. Rock (*Jim and Nell*, written in the dialect of North Devon), as well as Mr. Halliwell, records the word as a Provincialism, each of them defining it as "A species of quartz." Mr. W. H. Marshall, in his *Rural Economy of the West of England* (1796), says, "Intermixed with the soil, and often united with fragments of slate-rock, is found, in blocks and fragments of various sizes, a species of crystal or quartz,—provincially *whittaker*—which in colour is mostly white, sometimes tinged with red or rust colour." (i. 16.)

Uplands, which I visited on 12th June, 1880, is about half-a-mile west of the road from Plymouth to Tavistock, and about four miles from the former town. Mr. Fox, accompanied by his gardener, a middle-aged man, thoroughly familiar with the district, was so good as to take me to all the known Whitaker localities on and near his property, beginning

with a small plantation on the crest of the hill adjacent to his house. The blocks there were, no doubt, the most important group I saw, for though, as I was told, a large number had been taken thence for various purposes, the remainder contained so many specimens, and most of them of such great size, that they could not fail to rivet the attention of every geologist who saw them.

They were all partially, some of them it is believed deeply, buried in the soil, and a few were almost completely concealed by the growth of various plants rooted on them.

One of the blocks measured 10 feet \times 3 feet \times 3.75 feet; another, 10.5 feet \times 5.5 feet \times 3 feet—the last dimension in each case being merely the height above the ground. Making full deductions for irregularity of form, and ignoring the undoubted penetration into the ground, each of these two blocks must have contained fully 100 cubic feet, and, taking the specific gravity of quartz at 2.64 (*Ency. Brit.*, 8th ed., 1856, xii. 88), the weight of each must have been upwards of 8 tons. These were the largest blocks known anywhere in the district.

From the plantation we descended into the deep narrow valley it overlooks on the north-west, and noted an occasional Whitaker, here and there, on the slope as we passed down; whilst a rather greater number were found in and near the stream at the bottom—about 200 feet, by estimation, below the level of the plantation.

On the opposite slope we also saw a few blocks, and at the summit the gardener took us to a shallow straight gully, about 180 feet long and 25 feet broad—the length being in a direction transverse to that of the valley we had left—which he assured us had been made or, rather, reopened within his recollection, simply through the dislodgement of large Whitakers, which had lain huddled together in a long narrow stream, and, so to speak, had been quarried for road repairs. He added that, according to tradition, the existing gully was but the modern prolongation of one which had formerly extended in a north-westerly direction quite across an adjacent field, where it had been filled in; but of this he had no personal knowledge.

All the Whitakers I saw were of white opaque quartz, having, at least in some cases, indications of a laminated structure, and traversed occasionally by veins and crystals of the same material, the crystals looking in some instances suspiciously like pseudomorphs of feldspar.

The blocks were all more or less rugged, subangular, and without any decided traces of glacial polish or scratches. In

a very few cases smooth striated surfaces presented themselves, but were probably "slickensides" only.

The rock of the district is the well-known Devonian shale—termed "shillet" locally, and "killas" by the miners—of drab colour, having a tendency to divide into well-defined rhombohedrons, is occasionally traversed by small quartz veins, and, according to the Map of the Geological Survey of Great Britain, extending to great distances in all directions. Neither Mr. Fox nor his gardener knew of any parent rock which could have supplied the Whitakers.

At least some of the blocks, instead of lying at once on the shillet, were lodged in a heterogeneous accumulation of clay and stones, including Whitakers from the size of an ordinary apple to that of a common cocoa-nut.

That the blocks have travelled a considerable distance cannot be doubted; that their transportation was not effected by the action of water only is evident from their irregularity of form. From the facts I saw, it seems safe to say that at and near Uplands they are most plentiful on high ground; and unless those at low levels have rolled from above in recent times, the surface of the district must have been essentially the same at the era of transportation as it is at present.

Their presence must at times, no doubt, be an annoyance to the farmer; nevertheless the roads, the hedges, the common walls, and the numerous and large "rockeries" in the pleasure grounds of the district, show that they are by no means valueless, and that they have been very largely utilized. Indeed, it is to be feared that unless great care be taken to prevent it, those now remaining in the spots they have so long occupied undisturbed, may become rapidly fewer, and disappear altogether at no distant time.

In the foregoing remarks I have confined myself to the limited district I visited. Mr. Fox states that he has noticed similar blocks in other parts of the neighbourhood, and especially about two miles from Uplands, as the crow flies, towards the north and north-west. These localities I hope to visit on some future occasion, when materials for further notes may be met with.

THE FITTING OUT OF TWO VESSELS AGAINST THE SPANISH ARMADA AT DARTMOUTH IN 1588.

BY EDWARD WINDEATT.

(Read at Totnes, July, 1880.)

AMONG the documents of the Corporation of Dartmouth is a book of account of twenty pages of foolscap paper, endorsed on the outside :

1588.

"The booke of all ye vyttayling and all other charges bestowed upon the *Crescent* and the *Harte* in settinge them forth to serve the Queen's Ma^{tie} under my Lord Admyral and Sr. Francis Drake as followyth the first daye of Maye the *Crescent* for 70 men and the *Harte* for 30 men."

The first nine pages are taken up with entries of the stores placed on board the vessels; the account is, however, of such length that only a summary can be given.

In Froude's *History of England* is a graphic account of the difficulties encountered by Lord-Admiral Howard, Drake, and the other commanders, from the parsimony of Queen Elizabeth, and the consequent want of food and ammunition when the time of trial and the Armada arrived. It will appear, however, I think, that the two vessels sent out from the port of Dartmouth, and equipped at the cost of Dartmouth, Totnes, and the neighbourhood, were in every respect well supplied.

It will be noticed that the seamen were paid for four months' service, and the account is dated 1st May, so that they must have been paid off at the end of August, when the defeat of the Armada was complete, and what remained of it was being gradually but surely destroyed by the storms of the northern seas.

Froude tells us it was only by the beginning of May that

hopes of peace faded, and certain information arrived that the Armada was on the point of starting.

The men of Dartmouth, Totnes, and neighbourhood must therefore have allowed no time to elapse before they commenced their preparations, and fitted out the *Crescent* and the *Hart*, the one for seventy men, and the other for thirty men, to join in driving the invader from their shores; and, fully equipped, they would proceed to Plymouth and form part of the squadron with which Drake, on 23rd May, went out to meet the Admiral on his arrival in the Sound.

The following notes from the accounts will show the thoroughness with which the equipment was carried out. The first five entries are for biscuit supplied by various persons whose names are given, the value or cost being £37 2s. 10d.; the next five entries are for beer, at 10s. 6d. a hogshead, in all 125 hogsheads; then come entries of beef and pork, some fresh and some salted; for the fresh, barrels and salt being afterwards charged. A large portion of the beef and pork came from Totnes, and this was evidently fresh, being charged for as so many quarters.

Coarse and dried fish were also provided, and three barrels of butter, weighing 349 lbs., cost £5 16s. 4d., being at 4d. a lb. Thirty hogsheads of peas cost 3s. 8d. a hogshead.

Large quantities of wood were obtained; many pounds of candles at 5d. a lb., and tallow at 6s. 8d. a stone.

As to ammunition, of which the Queen's own vessels proved so short, the *Crescent* and *Hart* seem to have had a good supply.

Of powder, some of which was obtained from Plymouth, there was in all eighteen barrels, weighing 1,888 lbs., and varying in price from 10d. to 1s. a lb. There were also two barrels of "corne" (grain) powder, weighing net, 106 lbs., at 14d. a lb.

Next occur entries of cross-bar shot for "fawcon" (falcon), and chain shot and cross-bar shot for "mynyon" (minion), also round shot; and in all there were charged for 443 shot of various sorts, including eleven stone shot.

Two "sarses" (a sarse was a sieve or cloth for sifting powder), two fowlers with four chambers, two "fawcons" two "mynyons and carridges," and a single mynyon appear to compose the armament of the vessels, in addition to such as was already on board them; the falcon was a cannon carrying a 1 lb. 1 oz. projectile, and a minion was a small piece of ordnance, from 3¼ inch diameter at the bore, and 8 feet long, to 3 inches in diameter and 7 feet in length.

The arms consisted of three muskets with four dozen charges, four touch-boxes and one mole, which cost £2 14s.; eight calyvers with eight flasks, eight touch-boxes and one mole; two bastard muskets with one bandelora, one flask and touch-box and two moles; four muskets with their flasks, touch-boxes, and rests, and one mole; also six bandeliers and twelve charges, six muskets, thirty-six calyvers (of which fifteen were hired), sixty-four pikes (long and short), and twelve pike heads, six black bills; and one musket was supplied with a new stock, costing 2s. Nine swords cost 4s. 6d. "armying."

Of match, 56 lbs. came from Totnes, and 50½ lbs. besides was bought at 3d. a lb.; 9 lbs. of Rochell match cost 10d. a lb., and 8 lbs. of Roche match, 6d. a lb.

Eight oars are charged for, and a barrel of pitch, the latter costing 8s. 6d.; several barrels of iron; also ladles, sponges, rammers, &c., were furnished. Then further entries for beef, bread, and peas; also twenty-eight water-butts and hogsheads for water, nine hogsheads of salt for salting meat, and smaller quantities of salt.

Canvas was purchased for "waist clothes," for cartridges, bags, and enlarging sails, 74 yards of which was from Totnes.

A "medrynacke" (a sort of coarse canvas) for the *Harte* cost £1 4s., a chain for the *Crescent's* waist, at 2d. per lb., cost 6s. 8d., and 84 and 52 lbs. of old rope for "byrchinge" was supplied.

Cans, lanterns, platters, wooden dishes, and tankards were also procured, as well as three sheep-skins, which cost 4s., and three lambs-skins, 1s. 6d.; and a lead and line, 3s. 6d. The sheep and lambs-skins were probably for making mops for guns.

There are also charges for amounts paid the men of the *Harte* and *Crescent* for working before they went out, and for conduct money. At the end appears the following very curious entry:

"I^t paid to Pultron a badde Surgeon for the *Harte* 02-00-00"

Amongst a miscellaneous lot of articles next charged occur the following: A kettle, an iron crock, another which was hired, bolts, locks, "2 hapsens and 4 staples," nails, spars, dripping-pans, thread, tap borer, a peck of mustard seed, a mill to grind the mustard seed, a pound of brimstone, half a bushel of "girts" (groats), a ladle to melt shot, tubs, lead, &c., vinegar, tar, leather for the pumps, and £3 was paid the captain of the *Crescent* to buy necessaries.

That Totnes was much interested in the outfit is certain, not only from the amounts which we shall see the town contributed, but from the following entry :

"Item for Tottenes men charges ryding to Plymothe sundry tymes, and to Dartmouthe, and reymayning at Dartmouthe to sett the ships forthe . 05-06-08"

And at the close of the account occur the following entries :

"Item for Rychard Grybles charge ryding to London about the same besynes . 07-15-00
 It to Sir John Gylberts man for wrytting a letter . 00-02-00
 It paid to the owners of the Crescent for one Cwt. bysket and hhd. beer the maryners dyd eatte and drynke . 00-16-00"

The vessels appear to have been hired ; and further on a charge of £96 for tonnage for the four months is mentioned. The total cost of the outfit is thus summed up :

"Smy all the fyst vytteyling and charges . 447-11-4
 Itm more for the fyrst suplye . 045-03-6
 Itm more for the last suplye . 064-17-8
 Smy . 557-12-6"

On the next page of the book is the following list, showing the amount in which lands and goods were subsidised in Totnes, Dartmouth, and the hundreds of Hey Tor, Stanborough, and Coleridge :

"Tottones is in subseydye in lands.	.	.	.	096£
and in goods	.	.	.	640£
Dartmouth is in subseydye in lands	.	.	.	012£
and in goods	.	.	.	188£
Heytor is in subseydye in lands	.	.	.	452£
and in goods	.	.	.	903£
Stanboro is in lands	.	.	.	443£
and in goods	.	.	.	2419£
Colrydye and Armyryton in lands	.	.	.	540£
and in goods	.	.	.	2651£
Lands	.	452£	and goods	0903£
Lands	.	443£	and goods	2419£
Lands	.	540£	and goods	2651£

Sumy . 1435£ lands Sumy . 5973£ goods."

"For that wee are requyred by express comandement from my L of her Ma^{ties} most honorable pryvey counsell to have speciall care that all passees and thorough fares be carefullye and suffy-syentlye garded by daye and watched by night by suffycient dyscrette and able men so as no suspected or vagrant pson be suffred to passe wythout dew examynacion these are therfor in her Ma^{ties} name to will and requyre you that you cawse all the passage and thoroughfare townes wythin yo^r dyvysyon to be carefullye and dylygentlye watched and warded and yf anye suche suspecte or vagrant pson be founde, that you cawse him to be brought before us or the next Justice of Pease adioynyng to be dewlye examyned this fayle you^r nott att yo^r perill Greneweay the 111th of August 1588 Yo^r frends

JOHN GYLBERT

GEORGE CARYE

HEUGHE DOTTYNGE"

The next six pages of the book contain a list of the men on board each of the ships, and the amounts paid them. The names are not lost to this county, and a great number of them are still very general in Dartmouth and Totnes, but such lists are so uncommon that I give them in full here.

THE PAYNGE OF THE "CRESENTE" MEN.

First for vi weeks.

Itm. John Willson, capaytaynge			
Itm. Crystopher Waymoth, m ^r			
Itm. John Follett, masters matte for vi weeks	.	.	01 06 03
Itm. John Gorde, masters matte			
Itm. Morrysse Dale, pyllott for vi weeks	.	.	01 10 00
Itm. Thomas Bolter, qr ^r m ^r for vi weeks	.	.	01 06 03
Itm. Morrysse Cossen, qr ^r m ^r for vi weeks	.	.	01 06 03
Itm. Wyll ^m Lashe, qr ^r m ^r for vi weeks	.	.	01 06 03
Itm. Robert Wychame, qr ^r m ^r for vi weeks	.	.	01 00 00
Itm. John Furseman, purs. for vi weeks	.	.	01 00 00
Itm. John Wylliams, boteswyne for vi weeks	.	.	01 06 03
Itm. John Mudge, boteswynes mate for vi weeks	.	.	01 00 07
Itm. Nicholas Winchester, m ^r gonn ^r for vi weeks	.	.	01 02 06
Itm. Wyll ^m Neyle, m ^r gonns matte for vi weeks	.	.	00 16 10
Itm. George Lyttelljohn, qrs gonner for vi weeks	.	.	00 16 10
Itm. George Davye, qrs gonner for vi weeks	.	.	00 16 10
Itm. Robert Hollett, qrs gonner for vi weeks	.	.	00 16 10
Itm. Wyllm Hodge, qrs gonner for vi weeks	.	.	00 16 10
Itm. Thomas Ball, m ^r carpynter for vi weeks	.	.	01 03 05
Itm. John Hylley, m ^r carpynters mate for vi weeks	.	.	01 03 05
Itm. Walter Roche, steward for vi weeks	.	.	01 06 03
Itm. Richard Hastelyn, cooke for vi weeks	.	.	01 06 03
Itm. Henrye Carter, surgeon for one monthe	.	.	01 00 00
Itm. Edmonde Davis, swabber for vi weeks	.	.	01 00 07

Itm. Andro Beatte, qrs m ^{rs} matte for vi weeks .	00	15	00
Itm. Edward Martyn, qrs m ^{rs} matte for vi weeks .	00	15	00
Itm. Antonye Parker, qrs m ^{rs} matte for vi weeks .	00	15	00
Itm. Richard Webber, cowper for vi weeks .	00	15	00
Itm. Thomas Weeks, for vi weeks .	00	15	00
Itm. John Lashe, for vi weeks .	00	15	00
Itm. John Neyle, for vi weeks .	00	15	00
Itm. Ottes Aderyn, for vi weeks .	00	15	00
Itm. Thomas Foxe, for vi weeks .	00	15	00
Itm. Robert Puncherd, for vi weeks .	00	15	00
Itm. Wyllm Squarye, for vi weeks .	00	15	00
Itm. George Taylor, for vi weeks .	00	15	00
Itm. Petter Davye, for vi weeks .	00	15	00
Itm. Henrye Ball, for vi weeks .	00	15	00
Itm. Henrye Webber, for vi weeks .	00	15	00
Itm. John Dashing, for vi weeks .	00	15	00
Itm. Wyllm Roberts, for vi weeks .	00	15	00
Itm. Marlies Leman, for vi weeks .	00	15	00
Itm. John Bennett, for vi weeks .	00	15	00
Itm. Wyllm Vitterye, for vi weeks .	00	15	00
Itm. Wyllm Manlye, for vi weeks .	00	15	00
Itm. Robert Tanner, for vi weeks .	00	15	00
Itm. John Bychford, for vi weeks .	00	15	00
Itm. Henry Roche, for vi weeks .	00	15	00
Itm. John Bow, for vi weeks .	00	15	00
Itm. Richard Stannyng, for one month .	00	10	00
Itm. Thomas Melberge, for vi weeks .	00	15	00
Itm. Phyllip Wackham, for vi weeks .	00	15	00
Itm. Nycholas Coole, for vi weeks .	00	15	00
Itm. Henry Seay, for vi weeks .	00	15	00
Itm. Willm Beatell, for vi weeks .	00	15	00
Itm. Thomas Watson, lyvtenante			
Itm. Robert Dyere, for vi weeks .	00	15	00
Itm. Willm Babye, for vi weeks .	00	15	00
Itm. Edward Lyde, for vi weeks .	00	15	00
Itm. John Moreman, for vi weeks .	00	15	00
Itm. Rychard Barnepool, for vi weeks .	00	15	00
Itm. John Starnor, for vi weeks .	00	15	00
Itm. Richard Grant, corporal for vi weeks .	00	15	00
Itm. John Davye, for vi weeks .	00	15	00
Itm. John Stonoughe, for vi weeks .	00	15	00
Itm. Wyllm Nycolson, for vi weeks .	00	15	00
Itm. John Morryshe, for vi weeks .	00	15	00
Itm. Barnabe Dobson, for vi weeks .	00	15	00

Sumy £55 08 05

John Bourton
Robert Geysey } boyes
George Lytlejohn }

At pages 15 and 16 of the book is a similar account, containing exactly the same names and the balance of the wages, the time paid for being four months altogether. The second payment amounted to £102 13s., making in all £158 1s. 5d.

The captain, John Wylson, who is charged nothing for the first six weeks, now receives £14 for the four months; and the master, Christopher Waymothe, £9. The lieutenant, Watson, got £2 for the four months; and the three boys £1 each for the four months.

Richard Stannyng was only paid for one month in addition to the one month he had received.

In the margin against a few of the names are the names of other persons, being the persons to whom the money was actually paid.

In 1685 Sir John Hawkins had prevailed on the queen to increase the seamen's pay from 6s. 8d. to 10s. a month, which, it will be observed, is the amount charged here.

The following is the list of the *Hart's* men:

THE PAYINGE OF THE "HART'S" MEN.

For vi weeks.

Itn. James Hovston, capytayne	.	.	.	02	13	04
Itn. Thomas Anthonye, m ^r for vi weeks	.	.	.	03	00	00
Itn. John Shere, m ^{re} matte for vi weeks	.	.	.	01	10	00
Itn. Richard Sprage, qrs m ^r for vi weeks	.	.	.	01	06	03
Itn. Nycholas Malerye, qrs m ^r for vi weeks	.	.	.	01	06	03
Itn. John Oliver, qrs m ^r for vi weeks	.	.	.	00	15	00
Itn. John Cowle, qrs m ^r for vi weeks	.	.	.	00	15	00
Itn. Thomas Jerom, boteswyne for vi weeks	.	.	.	01	06	03
Itn. Richard Gallownye, boteswyne's mate vi weeks	.	.	.	00	15	00
Itn. John Dottrell, m ^r gonnn for vi weeks	.	.	.	01	02	06
Itn. Wyllm Collen, m ^r gonns matte vi weeks	.	.	.	00	16	10
Itn. John Lovett, steward for vi weeks	.	.	.	00	17	10
Itn. Anthonye Browne, cooke for vi weeks	.	.	.	00	17	10
Itn. Wyllm Pattye, qrs gonnn for vi weeks	.	.	.	00	15	00
Itn. Rycharde Grave, m ^r carpynter for vi weeks	.	.	.	01	06	03
Itn. Rycharde Sanders, trumpeter for vi weeks	.	.	.	01	10	00
Itn. Rycharde Godsland, for vi weeks	.	.	.	00	15	00
Itn. Barnard Adams, for vi weeks	.	.	.	00	15	00
Itn. Rycharde Nosworthy, for vi weeks	.	.	.	00	15	00
Itn. Edward Corbyn, for vi weeks	.	.	.	00	15	00
Itn. William Gardiner, for vi weeks	.	.	.	00	15	00
Itn. Robert Pker, for vi weeks	.	.	.	00	15	00
Itn. Thomas Downe, for vi weeks	.	.	.	00	15	00
Itn. Edward Owdye, for vi weeks	.	.	.	00	15	00
Itn. James Saverye, for vi weeks	.	.	.	00	15	00

Itm. John Berrye, for vi weeks	.	.	.	00	15	00
Itm. Wyllm Shethe, for vi weeks	.	.	.	00	15	00
Itm. John Antonye, for vi weeks	.	.	.	00	15	00
Itm. John Kyttingham, Lyvstenant						
Itm. Edward Hacker, corporal for vi weeks	.	.	.	00	15	00
Itm. Osmond Follett	} boyes			Smy	30	08 04
Itm. Myles Galloway						

In the account of the payment of the balance of wages to the officers and men of the *Harte* the same names appear, with one exception; viz.,

"Itm. John Forreter, pylott for v weeks . . . 01 11 03."

As in the case of the *Crescent*, the second account of pay is for ten weeks, making four months' pay in all. In the second account the captain gets £11 6s. 8d., and the master £6. The lieutenant got for the four months £2, and the boys £1 each.

The total of the second payment to the <i>Hart's</i> men was			
£70 08s. 11d., making in all for that vessel	£100	17	3
This amount, with the total for the <i>Crescent</i>	158	1	5
And the victualling and fitting out	557	12	6*
Made the total cost	816	11	2

There is no record as to whether either of these vessels took part in the fight.

These accounts are very legible, and the ink and paper remarkably good. On the last page is, in quite a different hand, and very illegible, the following account of the amounts at which the principal inhabitants in Totnes were rated towards the fitting out of these two vessels:

"A cotype of an accompt what everye man In Totnes was rated att for ye serves of the *Cresente* and the *Hartte* In 1588 from M^r Chrisfer Wyse of Totnes wch book he had from his Father and this notte of the payments was of his fathers wrytynge

	£		£
M ^r Jno Wyse Mayor	15	Th ^e Marten	1
M ^r Chrisfer Saverye	06	Jno Lacye	1
M ^r Lucke Serett	06	Robartt (?)	1
M ^r Jeffrye Bab	20	Richard Coker (?)	1
M ^r Walter Bogens	20	Chrisfer Croderay (?)	1
M ^r Nyc Godrege	20	W ^m Marten	1
M ^r Richard Bogens	07	Edward Gold	2

* In addition there was paid the owners for tonnage for four months £96, which would make the total cost £912 11s. 2d. In the account the payment to the men of the two vessels is entered in round figures at £280, making the total entered £918 12s. 6d.

Mr Ryc Everye . . .	07	Chrisfer Croker . .	2
Mr Nyc Leaman . . .	05	Rychard Lee. . .	2 10s.
Mr Chrisfer Walles. . .	02	W ^m Tyller . . .	2
Mr Chrisfer Savery yong ^r	05	Nicholas Serette . .	1
Mr Gabrell Kennycott . .	02 : 10	W ^m Yeo . . .	1 10s.
Mr Jno Haches (?) . . .	02	Tho Everye . . .	2
Mr Nyc Redman (?) . . .	02	Mystres Everye . .	1
Walter Dottin . . .	02	Symon Crolee . .	1
W ^m Duck . . .	01		
Rychard Hackwell . . .	01		<u>147£</u>
W ^m Croker (?) . . .	01		
Jno Nell (?) . . .	01 : 10		

Totnes had no small share in the outfit of the two vessels; and, in addition to all this expense, it is to be remembered that a Totnes man—Sir Edmund Lye, Kt.—in 1587 fitted out two ships at his own expense, one of which he presented to the Queen, and commanded the other himself, joining Drake in his expedition to Cadiz, but lost his vessel on the Cornish coast on his way home. He then fitted out another vessel, and served in it against the Armada.

And in addition to these two vessels five voluntary vessels went out from Dartmouth; viz., the *Roebuck*, Sir Walter Raleigh's, under Captain Jacob Whitton, which conveyed powder; the *Phoenix*, Mr. Gawen Champernowne's bark, of 70 tons and fifty men; the *Gabriel*, Sir John Gilbert's ship, of 150 tons and 80 men; the *Elizabeth*, Mr. Adrian Gilbert's, of 70 tons and sixty men; and the *Samaritan*, of 300 tons and 150 men.

Poring over the musty accounts of three hundred years ago may seem to some dry and uninteresting work; but when one comes across a paper such as the one I have described, and given extracts from, and sees the part that this immediate neighbourhood played in great events in our country's history, we are amply rewarded for all our trouble. We rejoice to know that our own and neighbouring towns shared in the conflict, and helped to increase the fame of our country, and with our own Devonshire postman-poet Capern we exclaim—

“The brave old men of Devonshire !
 'Tis worth the world to stand,
 As Devon's sons on Devon's soil,
 Though infants of the band,
 And tell old England to her face,
 If she is great in fame,
 'Twas good old heart of Devon oak
 That made her glorious name.”

THE ACCOUNTS OF THE RECEIVER OF THE
CORPORATION OF TOTNES IN THE
YEAR 1554-5.

BY JOHN S. AMERY.

(Read at Totnes, July, 1880.)

IN April, 1875, the Town Council of Totnes very kindly gave Mr. Edward Windeatt and myself leave to look over and examine the numerous documents in their possession. In the inner room adjoining the Council Chamber of the Guildhall at Totnes stands a very curious old chest, or hutch, which contains several drawers full of old papers, that had recently been examined by Mr. Riley, one of the Inspectors of the Historical Manuscripts Commission. At the bottom of this chest, going the whole length of it, is a shallow drawer, which we succeeded in opening, after some time, with great difficulty. In this drawer we found a roll of parchment, containing the accounts of William Ball, Receiver of the Corporation of Totnes in 1554-5.

This interesting document is not mentioned by Mr. Riley in his report; probably he was unable to open the drawer it was in. It consists of a parchment roll about forty inches long and ten inches wide; the receipts, with the headings in capitals in the margin on the one side, and payments or charges on the other side. It is very well written in small court hand. Fastened to it is a paper about twenty-four inches long by nearly nine inches wide, containing the "Rents of Assize," fixed or assessed rents. On one side are the rents due to the lord, and on the other those due to the town. There is also a small piece of parchment about three and a half inches square fastened to it, on which is written, in contracted Latin, the following, of which I give the translation:

"The Mayor and Burgesses of Totnes for the terms of Easter and Holy Trinity in the first and second years of the reigns of Philip and Mary by the grace of God King and Queen xxxvij^o per John Haydon."

This is the label referred to further on. I have given the spelling as it is in the roll, but some of the contractions are written in full. I have also given here and there some explanations, which are placed in italics between brackets.

This is the only roll we could find which gives a full and detailed account of both receipts and payments.

1554 TOTTENES 1555.

Thaccoumpte off William Ball Receivou^r Roger Crowte mayo^r there. Ffrom the xvth after the feaste of Saynt Mighell thār-keannge^{ll} yn the ffirste and second yeares of the raignes of our sooveraigne Lorde and Ladye PHILIPPE AND MARYE kyng and qweene. Untill the xvth after the same ffeaste on the seconde and thride yeares of the raignes of the same Philippe and Marye. And is for one hoole yea^r.

RENTS OF ASSISE.—Received by rents of assise [*Assessed Rents*] as perticulerly apeareth by a rental mentyoned on the backe side of this accoumpte for the towne and the lorde.

Sum xxx^{li} iiij^s iiij^d.

THE POIZ HOWSE.—Received for the poiz howse [*weigh-house*] then beyng yn the townes hands the recevor placyng a man for the keepyng of the same which man had for every market daye iiij^d which was levied and paid owte of the same receytes and his dynner given him the same market daye by the receivor at his owne charge which poiz howse amownteth clere unto

Sum xviiij^{li} v^s viij^d ob.

THE FISSHE SHAMELL.—Received ffor the fiashe shamells [*shambles*] at the hands of James Pelliton beeyng lett unto hym at ferme [*a lease*]^{li} iiij^s viij^d.

More received for certaigne standyngs of sutch^e as did stande withowte the same shamells yn the streete—iiij^s v^d.

Sum ij^{li} xvij^s jd.

CAWTERS FINES.—Received off sutch^e as keepe open shoppis within the same towne not beyng free of the liberties (but by the permyssyon of M^r Mayor for the which theye fyne with the receivor at the yeares ende) and is onely for artifycers so openyng theyr shoppis.

Sum iiij^s iiij^d ob.

In an old parchment-covered book containing the accounts of the Mayor's Court from 1663–1834 is the following entry on the fourth page :

November, 1663.—Various persons named were ordered to be summoned to be at the Guildhall, at the court there to be holden on next Tuesday, to compound for their several fines for using the liberties of the guild merchants in keeping open shops and buying

and selling in the said borough, not being freemen of the said borough, contrary to the usage and custom thereof. On December 1st, 1663, is the result: "Att this Court divers shop keepers not being freemen compounded for opening their shopwindows and using the Liberties of the Town not being free."

No further entry of this sort occurs in after years.

FFREE MEN.—Received off sutchē as have been taken in too the Company of Gwilde marchants comenly called free men (at which tyme every apprentice servyng fullye to the ende and terme of viij yeares, and any childe beyng borne and contynewyng within the same towne whose ffather had been free) did paye vj^s viij^d and otherwise xx^s, so I had and received of Ambrose Harte, William Toobyn, John Crowte and Water Blackhaller the soone of Phillip Blackhaller j^{li} vj^s viij^d.

Sum j^{li} vj^s viij^d.

CUTT.—Received off sutchē as dyd resorte unto the market with flesshe ffor a certaigne dewtie called Cutt—xij^s v^d.

Sum xij^s v^d.

COVERAGE.—Received off sutchē as hadd wares to sell yn the fayer upon our Lady daye thassumpeyon for a dewtie named cooverage—xvij^s x^d.

Sum xvij^s x^d.

TOLSWELL.—Received ffor tolsweil yn the ffayer parke upon our Ladye day thassumpeyon there the some of j^s v^d.

Sum j^s v^d.

PETI-CUSTOME.—Received ffor peti-customē of strangers—ijj^s xj^d.

Sum iij^s xj^d.

STRAYERS.—Received ffor a certayne bollock and a sheepe beyng strayers and so brought yn to the courte and solde—ix^s iijj^d.

Sum ix^s iijj^d.

RECOVERYS.—Received ffor the towne seale sett unto a recovery betwene Coole of Harberton and his sonne for certayne Lands—vj^s viij^d.

Sum vj^s viij^d.

ASSAWLTS AND BLOODSHEDS. Nonsewts and Plents.—Received ffor assawlts and bloodshedds with drawyng of plents and nonsewts—xv^s iij^d.

Sum xv^s iij^d.

RESCOUS.—Received ffor Rescous—ijj^s ij^d.

Sum iij^s ij^d.

FINES.—Received ffor fynes of sutchē as solde false yarne yn the markt—xj^s.

Plus of the bakers makyng theyr bread contrary the statute—0^s 0^d.

Plus of the brewers sellyng unlawfull measures of ale—0^s 0^d.

(The last two entries are struck out, as there was nothing received from them.)

Plus for certayne corne forfeited yn the market bicause it was solde contrary to an order and before the howers appoynted—xj^s.

Nota.—Yt is to be noted that Mr Mayor Received for certayne bread forfeited yn the market abowte iij or iiij^s which he sayed belonged not unto my ofyce.

Sum j^{li} ij^s.

MERCEMENTS AND ACCUSEMENTS.—Received ffor merciaments of the courte. And ffor accusements—xxvj^s ij^d. And for fynes for bred and ale.

Sum j^{li} vj^s ij^d.

THE LORDS POUNDS.—Received ffor the Lords pounds.

THE MAYORS POUNDS.—Received ffor the Mayors pounds.

Sum. Yt apereth upon my rentell and ys yn a grose some as above ys mencioned emonge other rents of assise.

ALE WEIGHTS.—Received off sutchē as dydd brewe withyn the towne and was vj^d by the yeare of sutchē as were free and of the reste vj^d for every tyme so brewyng—viij^s vj^d.

Sum viij^s vj^d.

EASTER.—Received ffor a dewtye called easter which is to be understood ffor the libertie of egressē and regresse goyng yn and owte at our dooers which is dewe to the lord at ij^d every howse—j^{li} iiij^s xj^d.

Sum j^{li} iiij^s xj^d.

FREE.—Received ffor a dewtie called free which is to be understood of every free holder havynge estate by endenture for terme of Lyfe ij^d whereas others not havynge sutchē estate do paye vj^d yff theye be free of the liberties—xij^s vj^d.

Sum xij^s vj^d.

CHEPE.—Received ffor a dewtie called chepe which is to be understood of sutchē are no free holders as before is mencyoned. And is vj^d of every free man beyng no free holder j^{li} x^s vj^d.

Sum j^{li} x^s vj^d.

PORTREVE.—Received of the heyres of Colton by that they were chosen to do the office of the porterevewike for the which they dyd fyne with Mr. Mayor to be voyd thereof paynge ij^{li} vj^s viij^d.

Sum ij^{li} vj^s viij^d.

ITCHE.—Received ffor Itche which is to be understood a sertayne dewtie of sertayne howses withowte eastegate which doo paye yearly ob [*a halfpenny*] of a howse for havynge yssewe [*issue*] backwards which amounteth to vij^d.

Sum vij^d.

CASTELL DITCHE.—Received ffor Castell ditche of sartayne tenements as apeareth upon my boke of the Towne dewties.—vj^s viij^d.

Sum vj^s viij^d.

Sum of my hole Receipts as is aboove particularly mencioned.

lxx^{li} vj^s viij^d.

On the back of the roll the expenditure is given as follows:

CHARGES to be deducted and allowed of my fformer Receyts as folowth.

Imprimis to Leonarde Rombylowe for the charge of
M^r Rodgeways horses the fyrste Lawe daye xx^d

Ffor waxe to seale the endentures for the burgeses iiij^d

Ffor chargs allowed M^r Mayor by expences doone upon
M^r Rodgewaye and others beyng here consernyng
sertayne false golde found upon sertayne persons vj^s vij^d

(Mr. Rodgewaye was the Recorder, and it is possible
that he either was, or was one of the family of Thomas
Ridgeway, of Torwood and Tor Abbey, and ancestor of
the Earls of Londonderry. See Prince's *Worthies*, p. 698.)

Ffor a staffe for one of the Constables iiij^d

Ffor makyng of the endentures of the ij burgesers xij^d

Ffor vij yards of brode clothe for the sergeaunts liveries
at viij^s per yarde and x^d for the cariage therof lvj^s x^d

Ffor the portage of a Lre [letter] to M^r Eidgcombe vj^d

(The Edgcombes of Cothele were Lords of the Manor
of Totnes, and in 1559 Sir Piers Edgcombe conveyed the
Manor to the Corporation for a rent of £21 per annum,
and a burgesship to his heirs for ever.)

Ffor wyne spent upon M^r Loovis iiij^d

Ffor reperacyons done upon the gwildehall xv^d

Ffor that was given the bell ryngers upon the newys
of the queenes beyng wth childe ij^d

Ffor a man to go ynto the contreye to fetch a wytnes
upon the examynacyon of a wooman iiij^d

Ffor chargs doone upon M^r Rodgewaye the 19th of
January beyng here concerning maters for the
towne ij^s xj^d

Ffor moneye ddz [given] by M^r Mayors commande-
ment unto the stewarde for M^r Prideauxe when
the shrifes wryte [sheriff's writ] came for the
attachyng of the mayor and burgeyses xx^s
which mony the stewarde ddz [gave] unto M^r
Predeauxe and the underahrif.

Ffor reparacyon done upon the pilorye ij^s x^d

Ffor a galon of wyne given the shrifes wyf viij^d

Ffor ryngynge of the erle of Bedfords knytle vj^d

(This was John, first Earl of Bedford, who died in 1555.
This family appear to have been connected a good deal
with Totnes, and their arms appear in the Guildhall and
Council Chamber. Francis, fourth Earl of Bedford, was
appointed High Steward of Totnes in 1630.)

Ffor cariage of ij chests of the qweenes treasor to Exetur by potter	iii ^j ^a
Ffor charge doone upon M ^r Rodgewaye the vj th of Aprell conseryng a mater betwene Barnard Smyth and the towne	j ^a vj ^d
(In the south aiale of the chancel of Totnes Church, called Martyn's aiale, there is a handsome canopied tomb— the effigy is wanting—of Watey Smyth, who died this same year, 1555. A Barnard Smyth was mayor in 1549 and 1565. From other documents it appears that the Corporation had granted him a lease of the town mills and mill pools, and that he afterwards claimed the mill pool and marsh, being the portion now adjoining the Priory grounds, as his own property, alleging it was formerly part of the dissolved priory, and that he had bought it.)	
Ffor charges paid unto the stewarde the x th of Aprell and ys for hys paynes and charges soundrye tymes riding for the townes affayers as appereth by his accoumpte shewed unto M ^r Mayor and by hym alowed	xij iiij ^d
Ffor an obyte holden at the annucyacion of our Ladye by the receivor as apereth by a booke of obyts which ys yn the churche and goeth owte of the rent of elwell	iii ^j ^a
Ffor newe makyng of the bulrynge and for setting thereof	x ^d
Ffor chargs spent upon the undershrif to have his advice upon M ^r Hockmore ys will for vj th xiiij ^a iiij ^d which he gave to the towne	iii ^j ^d
Ffor paper at sondrye tymes	ij ^d
Ffor chargs to the Stewarde the iij ^{de} of Maye as yn ryding to M ^r Eidgecombe and to the cesyons conseryng affayers of the towne as appeareth by his accoumpte shewed unto M ^r Mayor and by hym alowed	xj ^a
Ffor charges spent upon M ^r Richarde Eidgecombe with others beyng here yn comyssyon the vij th of Maye as doeth particulerlye appeare upon my booke yf I be so requyred	lj ^a viij ^d
Ffor his servaunts suppers and for theyre horsemeate at John Pelleys howse	xij ^a viij ^d
Ffor a man to go to Washeborne yn a message	iiij ^d
Ffor that I gave to sertayne mynstrells by the com- maundement of M ^r Mayor	iiij ^a iiiij ^d
Ffor a hoxed [<i>hogshead</i>] of wyne and for bearyng thereof	xxx ^a iiiij ^d

which was willed by Mr Mayor and his bretherne to be set yn the stretes and dronken at Larges upon the reporte of newys that the qwenes maiestie was delyvered of childe which was untrewa.

Ffor a man to go to Mr Rodgeways with a fre [letter]	vj ^d
Ffor the bearyng of the ij standers with Lighte before the watche on mydsomer yeven	iiij ^d
Ffor amendyng of the same standers	ij ^d
Ffor money given to dows [divers ?] to playe before the watche	vj ^d
Ffor money given to sertayne mynstrells which played at Mr Mayors	ij ^s
Ffor a man to go on a message to Engleborne . . .	ij ^d
Ffor di C [half hundred] of borde nayles for plankyng the gwildehall	vij ^d
Ffor a payer of glooves agaynste the fayer . . .	iiij ^d
Ffor the poiz hows unto John Symon	v ^s
Ffor waxe to seale the endentures for the burgeses the seconde tyme and for makyng the endentures .	xiiij ^d
Ffor that I allowed Mr Mayor for charges doone upon Mr Gressam when he was here with the qweenes treasure	xx ^s
Ffor that I p ^d John Jarman for ringynge of the bell for the corne market	ij ^s
Ffor that I allowed Mr Mayor for his Ketchyn and fee	viiij ^{li} vj ^s viij ^d
Ffor the receivor is fee	vj ^s viij ^d
Ffor Mr Rodgeways fee beyng recorder	xxvj ^s viij ^d
Ffor Mr Stere and Mr Prediaux is fees	xxvj ^s viij ^d
Ffor the stewards fee for the hole year	xxvj ^s viij ^d
Ffor makyng of an annvytie [annuity] and an obligacyon for the assurans of certaigne Lands given by W ^m Hackwell to the mayntenance of the condwyte .	ij ^s viij ^d
Ffor makyng the books of the xv th	xij ^d
Ffor makyng the bills to gather the pounds . . .	vij ^d
Ffor makyng a booke of presydents to gather towne dewtis	xij ^d
Ffor money p ^d unto Mr Haydon by that he was of counsale with the towne consernyng a certain mater then yn the Lawe and is for the tearmes of easter and trynytye as apereth by his libell .	xxxvij ^s

(This is the label before-mentioned in my description of this document as being fastened to it.)

Ffor the ij seargeants fees beyng W ^m Turpyn and John Hackwell	xij ^s iiij ^d
Ffor the retorne of an endenture from the shriffe for the laste election of the burgeises of the parliament	iiij ^d
Ffor expences doone upon M ^r Rodgewaye at Leonards at the Last Lawe daye when he rode forthe the towne	ij ^s iiij ^d
Ffor a hors for John Hackwell to ryde to Sir Thomas Denys with Peter Helman beyng sent for to be examyned upon the robberyng of M ^r Fulforde	xvj ^d
Ffor chargs p ^d unto Alse Prows by that M ^r Mayor and his bretherne was there at drynkyng with M ^r Rodgewaye and willed me to paye yt beyng	iiij ^s ij ^d
Ffor dooing the office of portereve and is p ^d unto W ^m Turpyn and John Hackwell	xl ^s
Ffor mooney p ^d unto M ^r Eidgecombe by ij severall payments that is to saye xvij ^{li} at thannunciacion of our Ladye and xvij ^{li} xiiij ^s iiij ^d at myghelmas and was p ^d unto the hands of W ^m Symons yn full payment of the hole yeares rente	xxxiiij ^{li} xiiij ^s iiij ^d
Ffor money to be deducted by that I do accompte for my hole rentale and have not R ^p [received] all sutch percells as are noted with this ω yn the margent nor can have no dystres which amounteth to	xxxiiij ^s viij ^d
Some [sum total] of the perticuler chargis above mentioned	lxvj ^{li} iiij ^s viij ^d

Anno secundo Philippe and Marie.

RENTES BELONGINGE UNTO THE LORDE.

Sowthhuishe [South Huish] rente by the yeare	x ^{li} xiiij ^s iiij ^d
Lodiswell rente	xl ^s
The rent of free men yearly for the markt for ever which is the Mayors pounds and the Lords pounds	iiij ^{li}
M ^r Barnarde Smythe for the mylles [mills] and Castell meadow	v ^{li}

Note.—Yt ys to be noted that there are sertayne gardens taken owte of the Castell meadowe and so let for rente unto W^m Coseby W^m Bogans and John Blackhaller and M^r Xpofer [Christopher] Savery by Barnarde Smythe all which gardens are parcells of the Castell meadow and so owght to contynew.

John Wotton for a close of lande yn Harperswell streate	xj ^s ij ^d
George Every for a payer of voyde walles and a garden	ij ^s
The heyres of Robart Hackwell for a tenement and garden within Northegate	ij ^s vj ^d
ω The rente of a tenement late of Tooker and nowe yn the tenure of	ij ^s vj ^d
ω The rente of a tenement late of Thoms Warren and nowe yn the tenure of	vj ^d
ω The rente of a tenement late of W ^m Gown and nowe yn the tenure of	ij ^s
M ^r Richarde Savery for a tenement named Streate-combe place	iiiij ^d
The rente of a tenement withyn braceters well, yt ys a chamber over the well	vij ^d
The rente of a tenemente yn the which Richarde Skynner sometyme dwelled	iiiij ^d
John Cohen for a voyde pece of grownde between his tenement and the tenement of Rich ^d Conye	ij ^s
Thomas Seyvar for the rente of Calehows	ij ^s
M ^r Yeo for the Castell dicke enclosed	iiiij ^d
ω The garden late of Robarte Dreton	ij ^s viij ^d
ω A stall yn the boucherewe	ij ^s viij ^d
Nicholas Coosen for the Lords poton	v ^s
Walter Cosbye for a garden	ij ^s viij ^d
ω John Prendergeaste for a tenement called the slaughter hows	xvij ^d
M ^r Nicholas Smyth for a garden	vij ^d
Dyonyse Skriche for ij gardens adioynyng to the Totine (!)	xiiiij ^d
Lewys Englyshe for the rotherfolde [<i>cattle market</i>]	xx ^d
Richarde Fursedon for a tenement	vij ^s vj ^d
James Deane for a howse yn the bowcherewe	xvij ^d
Sum xxiiiij ^{li} vij ^s vij ^d .	

M D + L V

RENTIS BELONGINGE UNTO THE TOWNE.

M ^r Xprofer [<i>Christopher</i>] Saverye for the howse upon east gate	vj ^s ij ^d
and for a garden	vj ^d

John Gribble for a qwillet of a garden nexte adioynyng to his howse which nowe lyeth yn comon with his herbe garden . . .	x ^d
W ^m Torryng the younger for a tenement and garden adioynyng to the clothe hall . . .	xj ^a
Nicholas Brookyng for a tenement and garden . . .	xxxix ^a
M ^r Walter Smythe for a pece of grounde yn hollowe lane . . .	iiij ^a
Rich ^d Newman for the tenement named the waye hows . . .	x ^a
John Renowf for a tenement withowte east gate . . .	v ^a
M ^r Nicholas Smythe for a tenement whereyn the clarke now dwelleth . . .	vij ^a
and for a garden . . .	viiij ^d
Thomas Pelley for a gardeyn adioynyng to Colturnehaye . . .	iiij ^d
M ^r Turpyn for a gardeyne yn prickell mare streate . . .	vj ^d
• A tenement yn Exetur named tabert . . .	vj ^d
Nicholas Alen for a garden . . .	ij ^a viij ^d
• M ^r Barnarde Smyth for Elwell Meadow . . .	iiij ^a
M ^r Yeo for a piece of grounde . . .	viiij ^d
W ^m Cosebye for the tenement adioynyng to eastegate . . .	iiij ^d
Edmonde the baseman for the tenement which he dwellyth yn for the which he payeth no rente . . .	vj ^a viij ^d
• Babcombe for a tenement yn the churchyearth . . .	ix ^a
he departed from hyt withyn the fyrste q ^r [<i>quarter</i>] and lefte no distres.	
Joane Lake for a tenement which is now yn the tenure of Thomas Martyn . . .	vj ^a
Nicholas Rose a pece of voyde grounde . . .	iiij ^d
Robarte Aisheley for a pece of voyde grounde . . .	iiij ^d
Colver parke which John Gribble p ^d me for . . .	ij ^d
• A tenement withowte eastegate belongynge unto the mawdelyn . . .	xij ^d
(The Mawdelyn was the Lazar house, a religious house or hospital, called "The House of Lepers of St. Mary Magdalene," vide "Religious Houses of Totnes," by E. Windeatt.)	
Thomas Crewse barbo ^r for pytchyng upon a wall of the howse nowe yn the tenure of Nicholas Brookyng . . .	j ^d

Sum v^{li} xvj^a ix^d.

STEVEN BOROUGH, THE NAVIGATOR.

BY RICHARD W. COTTON.

(Read at Totnes, July, 1880.)

IN a corner of North Devon, bounded on one of its sides by the lower waters of the river Torridge, and on another by the sea, lies the parish of Northam. From the breezy height of its churchyard you look down upon the grassy alluvial flat which the famous pebble-ridge protects, only too ineffectually as it is feared in these days, from the surges of the Atlantic. Farther away, on the right hand, between grey sandhills, the united rivers Taw and Torridge find their way into Barnstaple Bay. The church tower, in the shadow of which you may be standing, has for centuries served as a landmark to seafarers making for the Bar, and, until the restorers took it in hand, was regularly whitened to be more conspicuous for the purpose.

Early in the sixteenth century, at Borough, in this North Devon parish—afterwards to be better known in historical romance—there were born two brothers, Steven and William Borough,* whose names are entitled to a very early place in the long roll of eminent Devonshire seamen. The younger of the two, long afterwards, when dedicating one of his works to Queen Elizabeth, thus reverts to his early days, and, we may imagine, with recollections of Boathithe and Appledore, where he and his brother had made their first nautical essays: "My minde earnestly bent to the knowledge of nauigation and Hydrographie from my youth . . . hath eftsoones beene moued by diligent studie to search out the chiefest points to them belonging: and not therewith sufficed hath also sought by experience in diuers discoueries

* The name is of course spelt in a variety of ways, after the manner of the time. In one instance it actually occurs as *Aborrawh*.

and other voyages and traualles to practise the same.”* There was a difference of ten or twelve years in their ages, but the lives of the two brothers were curiously linked together throughout. They sailed as messmates in more than one adventurous voyage; they were employed in the same great mercantile service; and both ultimately attained important positions in the naval administration of their country. One of those families of the minor gentry ignored by Heralds’ visitations, the Broughs of Brough had probably from Anglo-Saxon times thriven on the small patrimonial estate from which their name had been derived. The offshoots of such family stocks as this, here and there in our own county—as witness Davis of Sandridge, and Oxenham of South Tawton—were just the men, it seems, to catch the impulse of that new and remarkable passion for enterprise beyond the seas which, in the period of which I am writing, first began to pervade English life. Agnes, a daughter of John Brough, whose will was proved in the Exeter Probate Court in the year 1570 and with whom at least the main line apparently died out, brought the estate to the Leighs by her marriage with Thomas Leigh; and a daughter of this match married one of the Giffards of Brightleigh, North Devon—a prolific stock—and thus became allied to many of the best Devonshire families of the day. There are now no traces of the Broughs surviving at Northam, and the last remains of the old house at Brough were removed a few years ago.

It is, however, with STEVEN BROUGH that I shall have principally to do in this paper, and I propose to bring together the scattered passages of the life of this Devonshire worthy. So far as I know, he has not been noticed by any local biographer; and it is tolerably certain that he was unknown to the author of *Westward Ho!* or Charles Kingsley would have scarcely failed to make use of the apt coincidence that Brough, the ancestral home of his imaginary hero—which we recollect nestling “amid its ring of wind-clipt oaks” and surrounded by its “shell-paved garden walks”—had been, a generation or so before, the scene of the boyhood of one of those Devonshire seamen of a bygone time for whom he had such wholesome admiration.

Steven Brough left his name upon the map of the world; but it is not pretended that he was by any means of the foremost rank as a discoverer. He belongs to a somewhat archaic period of English maritime adventure, and, by association, rather carries us back to the first explorers on the

* HARLUYT, vol. i. p. 417.

shores of the North American continent than forward to the crowd of enterprising navigators of the reign of Queen Elizabeth, which he preceded by a quarter of a century. The region into which he penetrated was entirely new to the English seamen, offering to the imperfect knowledge of the day strange attractions; and the revived interest which has been recently drawn to it, after the lapse of centuries, by the successful voyage of Professor Nordenskiöld, naturally recalls these earliest adventures of our fellow West-countryman in pursuit of the same object. Steven Borough was born at Northam in the year 1525. Of his early years, as might be expected, we know nothing. That he took to the sea betimes may be inferred from the experience with which he appears to have been accredited when, at about twenty-seven years of age, we first meet with him patronized by Sebastian Cabot, the illustrious navigator who in early life had anticipated Christopher Columbus in the discovery, or rather rediscovery, of the mainland of America. Cabot had returned about the year 1548 to Bristol, which is generally supposed to have been the place of his birth, after some years of adventurous service under the flag of Spain. It was from Bristol that the earliest English voyages of discovery under the Cabots, father and sons, back in the time of Henry VII., had been started. Bristol merchants, at even an earlier period, had traded regularly with Iceland; and William Canynge, it is recorded, had lost a ship there. Sebastian Cabot, now the very old man which he is represented to be in his portrait by Holbein, which still exists, was still nominally "Grand Pilot of the Emperor's Indies"—a notable and, as we learn, venerated personage. The traditions of his famous voyages were no doubt imbibed by Steven Borough, and we need not go far to discover how this may have happened. The ordinary and trading intercourse between the old port of Barnstaple, in which Northam lay, was then, as it has continued (for the most part, down to a time within the memory of many now living,) to be, coastwise. To one bred on the borders of the Severn Sea a voyage to Bristol, then the second great port of England, would naturally be the first step of nautical ambition. The interest in Sebastian Cabot's early attempt to find a north-west passage to the Pacific had long subsided. The desire to seek a way to the Indies free from any chance of interference from the Spaniards or Portuguese who commanded the southerly routes was revived; and Cabot, perhaps distrusting from his own early experience the prospects of a north-west passage, now urgently pointed to the possibility of

an alternative route to Cathay by the north-east. His day as a navigator was, however, past: "Waxing olde," he said, "I give myself to rest from such travels, because there are nowe many yong and lustie pilots and mariners of good experience, by whose forwardnesse I doe rejoyce in the fruit of my labours."* A question of the practicability of a sea-passage directly across the North Pole had obtained some notice, years before, from the advocacy of a remarkable man for his day, one Robert Thorne, a merchant of Bristol, who wrote an "Exhortation" to Henry VIII., in which he pointed out the probability that a temperate region would be found surrounding the Pole—the Polynia or open polar sea of later speculations, in the existence of which Sir Roderick Murchison was inclined to believe, and which the Russian Von Wrangel thought that he saw. The ideas which then prevailed about the geography of the extreme northern limits of Europe and Asia were singularly wild and misty. It was a matter of doubt whether or not any open sea existed beyond what was known of the northern parts of Norway. That there was a Scythian promontory far away to the east had been known, or more probably conjectured, from the time of Pliny; but to the geographers of the sixteenth century the long stretch of coast beyond it was absolutely unknown. It is curious to see how this blank was hypothetically filled up. Dr. Dee, philosopher, cosmographer and astrologer, surmising that the course after passing the Tabin promontory (of Pliny) would be mostly southerly and easterly, wrote: "You shall [then] fall in with the famous river Oecharde, which I conjecture to pass by the renowned city of Cambalu . . . and then, in lat. 46°, you may enter Quinsay haven." In the maps of Abraham Ortelius (1572), by far the best representation of the geographical knowledge of the time, immediately beyond the Scythian promontory, which is delineated with some approach to accuracy, however obtained, the coast line runs almost due south under the meridian corresponding with ours of 120 E., until, between 50° and 60° N. lat., it falls into the mouth of a great river leading to Cambalu—explained as *Cataie Metropolis—habet 28 mill: in circuitu*. On the east coast, in the longitude equivalent to our 167 E., is placed the harbour of Quinsai—*id est civitas celi*. Of course, we have here an attempt to fix the marvellous descriptions of Marco Polo. The same imperfect geographical knowledge of this part of Asia still existed more than a

* RAMUSIO, translated by HAKLUYT. *The Principal Navigations, &c.*, vol. iii. p. 6.

hundred years later. In the fine Dutch maps of Peter Husson, published at The Hague in the latter half of the seventeenth century, the extreme north-eastern limit of the continent is rounded off at least forty degrees farther to the west than it ought to be, and a wide ocean separates it from the nearest coast of America. The Dutch had reached Japan from the south long before this, but it is evident that nothing was even then known of what lay farther north. No difficulties were, therefore, anticipated beyond Cape Tabin, and the course thence to the seductive land of Cathay seemed easy enough. It is impossible not to see that Sebastian Cabot had in his mind's eye regions yet undescribed, teeming with tropical luxuriance and mineral wealth like those of Brazil and Paraguay (where nearly a quarter of a century before he had spent five of the best years of his life), which might be discovered in the far north-east. Although he himself had formerly reached a high latitude in the western hemisphere, no terrors of Arctic ice on the way seem to have disturbed these anticipations. As to time, the ordinary East Indian trading voyage of the Portuguese, out and home, occupied three years—it was argued that by the new route it might be accomplished in less than half the period. It is probable that in the western world, at the time of which I am writing, nothing new had been added to the popular conception of the great empire of China—as yet only vaguely known as Cathay—which had been derived from the accounts of Marco Polo. But the successive and striking discoveries of the Spaniards in the West, and of the Portuguese in the East, Indies were stimulating the incipient commercial enterprise of the English. From the participation in the advantages of those discoveries other maritime nations had been jealously excluded; and the days when Drake and his compatriots dared to wrest the spoils from their rivals, and, as Motley says, to let the world know that the ocean was not a Spanish lake, had not yet come. The Spaniards had coldly taken up their illustrious Genoese pilot—the English warmly accepted the leading of the Venetian; but the range of the English was as yet limited to the northern seas.

Such then was the state of geographical knowledge in this country, when a joint-stock company of Merchant Adventurers—"certain grave citizens"—was formed in London, of which Sebastian Cabot was appointed governor, for the "discoverie of Regions, Dominions, Islands, and places unknown." In defiance, apparently, of much incredulity, an expedition, under the command of Sir Hugh Willoughby as

captain-general, was fitted out, consisting of three ships. The master of the largest of these, the *Edward Bonaventure*, 160 tons, with a crew of fifty men, all told, was Steven Brough; and Richard Chancellor sailed in her as pilot-major of the fleet. William Brough, then a boy of sixteen, followed his brother's fortunes, and accompanied him. According to Strype, quoted by Mr. J. F. Nicholls in his *Life of Sebastian Cabot*, "this famous expedition was set on foot from Bristowe, where Cabot then lived," and from this passage Mr. Nicholls thinks, I believe on insufficient grounds, that "we are therefore justified in supposing that the ships were built on the spot,"* *i.e.* at Bristol. There is, however, enough reason to suppose that Cabot there picked up some of his "young and lustie pilots," and among them the Broughs. Nothing could be more admirable in their way than the instructions which Cabot drew up for the guidance of the intending discoverers, and for their conduct towards the people of the new countries with which it was expected that they would fall in—in marked contrast to the actual atrocities of the Spaniards, of which he had had some experience. On the 20th of May, 1553, the ships were towed down the Thames, "the sailors appparelled in watchet or skie-coloured cloth"—the navy blue of the Tudors—and at Greenwich, "where the Court then lay," there was a great demonstration previous to their sailing. The expedition, in reality only a trading venture, although on a magnificent scale for the period, excited an amount of popular interest which may almost be termed national; and we are told that the young king, Edward VI., who had a boyish love of the sea, would fain have witnessed its departure from the windows of the palace, but was then prostrate by sickness, which too soon afterwards proved mortal. Ultimately, from Harwich, "with a good winde they hoysted up sayle, and committed themselves to the sea, giving their last adieu to their native countrey, which," it is pathetically added, "they knew not whether they should ever returne to see againe or not." After falling in with the Lofodens, the fleet was dispersed by a storm, and the *Edward Bonaventure* parted from her consorts. It is to be remembered that at that time no map existed which did not show a conjectured line of coast uniting Norway with Greenland. The explorers had now therefore no chart to guide them farther. At the Lofodens, however, which were found "plentifully inhabited," local information had come to their aid, and before the separation (which happened on the 3rd of August)

* *Op. cit.* p. 154.

Willoughby had appointed a rendezvous for the fleet at Warehouse* (Vardö) on the eastern side of the North Cape.

Sir Hugh Willoughby, with his two ships, followed a course north-eastward, and sighted land which there can be no doubt was the coast of Novaya Zemlya; but was driven back, and ultimately, on the 18th September, reached the coast of Lapland. There he and his comrades were overtaken and overwhelmed by the rigours of an Arctic winter, for which they appear to have been in no sense prepared; and in the following summer the ships and the frozen corpses of their crews were found by some Russian fishermen. There were seventy victims in all to this catastrophe. Famine was not the cause of their death, because their store of provisions had not been exhausted; nor extreme cold, because they had not turned their ships into fuel; it is, therefore, to be presumed, that they all died of scurvy. This part of the story has been often told. Chancellor and Borough, after the separation of the *Edward Bonaventure* from the fleet, were resolute to continue the voyage, although their men were "not a little troubled with cogitations and perturbations of minde, in respect of their doubtful course." Rounding the northern extremity of Europe, and failing to rejoin the missing ships at the appointed rendezvous, they continued their course into a latitude where, to their great astonishment, they "found no night at all, but a continual, light and brightness, of the sunne shining clearly upon the huge and mightie sea." At length they entered the Bay of St. Nicholas, now known as the White Sea, and landed near the site of the present city of Archangel. The English ship was the first which had ever entered that vast inlet, and the native fishermen were amazed at the apparition.†

The commission to this expedition, primarily intended for a voyage to Cathay, had been sufficiently comprehensive; but it is curious that Russia is not even incidentally mentioned in it, and there is no indication that any idea of falling in with any part of its coast had been entertained. There can be no doubt that the discovery of the Muscovite territory in

* This place, a castle or fortress of the old Norwegian kings, had been already known sixty years before to the Russians, who had reached it in boats, according to an account given by Herberstein in his *Notes upon Russia*, (Hakluyt Society, vol. i. p. 105), when "Master David," a Scotchman, Ambassador from the King of Denmark to the Grand Duke, took this extraordinarily circuitous route in returning to Denmark, the Muscovites being at war with Sweden.

† See HAKLUYT. *The Newe Navigation and Discoverie of the Kingdome of Moscovia by the North-east in the yeere 1553*, vol. i. p. 245 et seq. Attributed to Clement Adams.

the north must be deemed to have been a pure accident. At that time, before Ivan Vasilivich, the master of 100,000 horsemen, had roused the civilized part of Europe by his conquests, and appalled it by his terrible cruelties, little was known in England about Russia, and it may be doubted if one Englishman in a thousand had ever heard of it. It had no access to the sea in the Baltic or the Euxine, and its northern coast, inhabited by a few wandering tribes of Lapps and Samoyedes, was washed by an icy sea on which no Russian ship had yet sailed, and which to the geographers of Europe was scarcely more than a myth. It is not easy to apportion the credit of this discovery between Chancellor and Borough. There is nothing to show that they were not in perfect accord. Chancellor's name is usually associated with that of Willoughby in the expedition, and, whatever may have been his special duties, that his rank in the fleet was superior to Borough's there can be no doubt; but their relative positions and respective authority on board of Borough's ship it is impossible at this day to define. Chancellor was a fine specimen of an Englishman—brought up in the same school as Sir Philip Sydney. Richard Eden, the translator of Peter Martyr's *Decades of the Newe Worlde, &c.*, who knew him personally, refers to him as "that excellent young man . . . no lesse learned in al mathematicall sciences then an expert pilotte." His death, not long afterward, by shipwreck, was a noble one. At the same time, it is not unreasonable, I think, to assume that, after the separation of the *Edward Bonaventure* from the rest of the fleet, Borough's determination had not the least to do with the further prosecution of the voyage with that ship alone. There are not wanting evidences that this was the view of his contemporaries. Steven Borough is twice described in his epitaph as the discoverer of Russia or Muscovia. In the sense that New Zealand was discovered by Tasman, this would scarcely be accurate; but viewed as was the discovery of India by Vasco da Gama, the parallel would undoubtedly hold good. Odd and somewhat hyperbolical as it may seem, it is nevertheless presented to us as a fact, that Russia was discovered in the sixteenth century by a Devonshire man.

It seems to have been considered that enough had been done for the voyage for that season. While Borough and his crew were wintering at the mouth of the Dwina, Chancellor, in the character of political agent, proceeded overland by a sledge journey to Moscow. He appears to have been cordially welcomed at the semi-barbaric court of the Grand

Duke, and with an adroitness which is remarkable, he succeeded in obtaining important mercantile privileges for the adventurers from Ivan Vasilivich. In the following year (1554), as we learn from a letter of one Master Henry Lane to the Worshipful Master William Sanderson, printed in Purchas, "the said ship, *Edward Bonaventure* (although robbed homewards by Flemings), returned with her compaie to London, shewing and setting foorth their entertainments and discoverie of the countries." * The Merchant Adventurers were subsequently incorporated by charter, and became known as the Muscovy Company, Sebastian Cabot being made governor for life. The company were not slow to take advantage of the monopoly of the Russian trade which they had thus accidentally acquired. But the paramount influence of Cabot is still discoverable in the revived project of seeking a north-east passage, and the company were still occasionally styled (whether jocularly or not I am unable to determine) the "Merchants of Cathay." The estimation in which Borough's capacities were regarded is now evident from the fact that within two years he was selected to command a second expedition for that search.

Whether or not the merchants had been too heavily bitten by the disaster which had happened to the first expedition; that their ardour for the China trade had cooled; or that they were satisfied at present with the prospective gains from the Russian; the scale on which this second expedition was projected strikes us by its comparatively very stinted proportions. A single vessel, the *Searchthrift*, was fitted out for the voyage. She was a pinnace, probably only half-decked, drawing, as we learn incidentally, less than five feet of water—certainly not so large nor probably so seaworthy as a modern Brixham trawler. According to Purchas, she had on board, besides Steven Borough, his brother William and eight others. That the explorers should have set out in their little craft, with the simplest provision for the undertaking, on a voyage of some seven thousand miles, the course of which, for the greater part, would lie through as yet unknown seas, seems heroic in its audacity. Their chances of success we now know were infinitesimal. The personal concern of the veteran, Sebastian Cabot, in this project is conspicuous, and his supervision of the preparations for the voyage and minute care for the welfare of the explorers are as distinguishable as on the former occasion. Borough's own narrative of the voyage is printed in Hakluyt's collection—" *The Navigation*

* *Purchas his Pilgrimes*, vol. v. p. 249. 1625.

and discoverie toward the Ob, made by Master Steven Burrough, Master of the Pinnesse called the *Serchthrift*, with diuers things worth the noting, passed in the yere 1556."* This narrative is of peculiar interest from its being almost the earliest account of an English voyage which exists in the language. On the 27th of April, 1556, at Gravesend, previous to the sailing of the *Serchthrift*, Sebastian Cabot, accompanied by "divers gentlemen and gentlewomen," went on board to inspect the arrangements for the voyage—just as a party of friends of the company might do in these days. "After that they had viewed our Pinnesse and tasted of such cheere as we could make them aboard," says Borough, "they went on shore giving to our mariners right liberall rewards." Afterwards, there was much feasting at "the signe of the Christopher," the venerable Cabot himself joining in the dance, and, adds Borough, "he departed, most gently commending us to the governance of Almighty God." The *Serchthrift* sailed on the 30th of April, and in Orwell "Wannes" joined company with the *Edward Bonaventure*, Borough's old ship, going to the White Sea on the business of the company, which Borough was to take charge of as far as Wardhouse. It was not until the beginning of June that they rounded the North Cape, which Bayard Taylor described as "the long line of purple bluff presenting a vertical front of 900 feet in height to the Polar Ocean," and which, Borough says, "I so named the first voyage." The name, appropriate if unimaginative, which this distinguished headland retains, and by which in all languages it is known, was, therefore, given to it by a Devonshire man. Soon afterwards the *Edward Bonaventure* parted company. The voyages of those days, read by the light of modern navigation, are tedious; more time seems to have been spent in riding at anchor, waiting for a wind, than actually at sea. Another month was spent by Borough creeping along the Lapland coast, when he was again at the entrance of the White Sea. Here, he remarks, "it is all sunke land, and full of shoales and dangers, you shall have scant two fadome water and see no land." On the 15th of July he "went in over the dangerous barre of Pechora and had upon the barre but one fadome water;" coming out, he says, "wee had but five foote water . . . we thanke God that our ship did draw so little." On the 21st he first fell in with the ice—"a monstrous heape . . . which was a fearefull sight to see"—in which they were enclosed before they were aware of it, and so remained for six hours. 25th:

* HAKLUYT, vol. i. p. 274.

"On St. James his day bolting to the windewardest, we had the latitude at noone in $70^{\circ} 20'$. The same day at a southwest sunne there was a monstrous Whale aboard of us, so neere to our side that we might have thrust a sworde or any other weapon in him, which we durst not doe for feare hee should have overthrowen our shippe: and then I called my company together, and all of us shouted, and with the crie that we made he departed from us: there was as much above water of his backe as the bredth of our pinnesse, and at his falling downe, he made such a terrible noyse in the water, that a man would greatly have marvelled except hee had knowne the cause of it; but God be thanked we were quietly delivered of him." On the 31st he anchored under the island of Waigatz: "This day there was a great gale of wind at north, and we saw so much ice driving a seaboard that it was then no going to sea." On the 3rd of August he passed through the Strait, and on the 5th, he says, "we saw a terrible heape of ice approach neere unto us, and therefore wee thought good with al speed possible to depart from thence, and so I returned to the westwards againe, to the Island where we were the 31 July." From that time until the 22nd of August we read of "a cruel storm . . . the ice came in so abundantly about us at both ends of the Island that we roade under that it was a fearfull sight to behold: the storm continued with snow raine and hayle plenty." Again: "This present Saturday [22nd of August] we saw very much ice and were within two or three leagues of it: it shewed unto us as though it had beene a firme land as faire as we might see from Northwest off us to the Eastwards. . . . And thus we being out of al hope to discover any more to the Eastward this yeere, wee thought it best to returne, and that for three causes. The first, the continuall Northeast and Northerly winds which have more power after a man is past to the eastwards of Caninoze then in any place that I doe know in these Northerly regions. Second, because of great and terrible abundance of ice which we saw with our eyes, and we doubt greater store abideth in those parts. I adventured already somewhat too farre in it, but I thanke God for my safe deliverance from it. Third, because the nights waxed darke, and the winter began to draw on with his stormes: and therefore I resolved to take the first best wind that God should send and plie towards the bay of St. Nicholas and to see if we might do any good there if God would permit it." They reached Colmogro, on the river Dwina, early in September, where they wintered, "expecting the approach of the next summer to proceede farther in our

intended discoverie for the Ob." The voyage, which had thus lasted more than four months, had, of course, proved abortive; not more than a quarter of the distance had been accomplished. Borough's expectations, if they had been at all sanguine, were considerably diminished, as nothing more is said about Cathay, and his plans for the following season seem to have been limited to reaching the great river Ob. These, however, were not to be realised.

The river Ob occurs so frequently in the schemes of further discovery which the Muscovy Company entertained, that we are bound to conclude that there was something more stable than mere conjecture to account for the circumstance. Until recently, whatever knowledge they may have possessed, and apparently did possess, seems to have been lost. The Ob, or Obi, and the Yenessei, two remarkable rivers, which drain the greater part of the vast area of Siberia, there is reason to suppose, formed an internal channel of communication, by which the products of China found their way to Novgorod, the great commercial mart of the sixteenth century. Now, these rivers, still very imperfectly placed on the best maps, disembogue into the Kara Sea together, and it is probable that they were confounded under the one name of the Ob. The importance however of the Yenessei, the name of which was thus obscured, may be judged from the fact that at 2,000 miles from the sea it is more than a mile wide.* It is said to be the third largest river in the world; and Lieutenant Palander determined its mouth to be seventy miles wide, and that it was divided by an island thirty miles long, invisible from either bank, which had been overlooked by the Russian surveyors.† The Kara Sea, into which these great rivers find their outlet, is almost land-locked by the Novaya Zemlya group, and has been described as in the form of a bag. In extent and shape it is something like the North Sea lying between Great Britain and the opposite coast from Holland to Norway. It lies N.E. and S.W., is comparatively shallow, and is open at its north-eastern extremity to the full drift of the polar ice. Access to it from the west is, as far as is at present known, only through three straits; the northernmost of these is Matyushin Shar, dividing Novaya Zemlya—a mere cleft, long, narrow, and deep. The middle and widest passage is between Novaya Zemlya and the island of Waigatz‡

* SERBOHM, *Proceedings Royal Geographical Society*, Jan. 1878, vol. xxii.

† *The Arctic Voyages of Adolf Erik Nordenskiöld*, 1858–1879. London. 1879.

‡ This is the original Russian name. The Dutch applied it afterwards indifferently to the straits, because, as it seems, the word means in their language, significantly, "blow-hole."

(spelt in a dozen different ways) from thirty to fifty miles in width. This was the strait which Borough was the first navigator to discover and pass through, and it was known to the Muscovy Company afterwards as "Borough's Straits." It was so called in later years by the Dutch; and that eminent geographer of European reputation, the late Dr. Petermann, of Gotha, retained it in his maps; but our own Hydrographic Department, perhaps in compliment to Russia, has dropped it, and the strait is known in the Admiralty maps as often by its Russian name of Karskoi or the Kara Gate. South of the island of Waigatz is a narrower channel, separating it from the mainland, which was discovered in 1580 by Pet, who had sailed as an ordinary seaman with Borough on his first voyage, and this is the one now most frequently used. These peculiarities in the physical geography of the Kara Sea account for the fact that it has always been found more or less choked by ice; that it has been deemed impracticable and unnavigable; and that it has been the bugbear of many successive generations of explorers in that part of the world. In this character it flashed through the imagination of Milton, and we find it imbedded in one of the stately similes of *Paradise Lost*—

"As when two polar winds blowing adverse
Upon the Cronian Sea, together drive
Mountains of ice, that stop th' imagin'd way
Beyond *Pelso* eastward, to the rich
Cathayan coast"

While Borough had been struggling with the ice at the entrance of the Kara Sea, his old messmate, Chancellor, had sailed for England with a Russian ambassador, having in convoy the two ships of Willoughby's expedition, which had been recovered. These ships were now missing, and were supposed to be somewhere on the coast of Norway; and Borough, being ordered to search for them, returned in the summer of 1557 to England, having executed his commission on the way—that is to say, one of the ships was reported to him to have gone to pieces on a rock near Trondjem, and the other was never more heard of. As Master Henry Lane, already quoted, surmised, they "in foule weather and wrought seas after their two yeeres wintring in Lapland became as is supposed unstanck and sunke, wherein were drowned also diver Russes Merchants and servants of the Ambassadour."*

If we except the early adventure of Sebastian Cabot—

* *Paradise Lost*, book x. line 291, &c.

* *Purchas his Pilgrimes*, *ib.*

and whether or not he may be considered to have been an Englishman is a question which I will not venture to answer—the two voyages of discovery in which Steven Borough took part were the first of that long series of English Arctic expeditions which have attracted the energy and even enthusiasm of our countrymen. The project of a northern route to China had slept for half a century; its direction only was new. The enterprise will appear all the more bold and adventurous when we consider the vague terrors of the unknown regions through which the explorers attempted to thrust a passage, and the miserably insufficient appliances with which they went to cope with them. Measured by the later achievements of English navigators, the results of Borough's voyages were undoubtedly insignificant; but every successive explorer in those Arctic regions has advanced upon the knowledge and experience gained by his predecessors. The extreme northern latitude reached in Borough's second voyage would not now be considered a very high one; it was not, in fact, higher than that of the North Cape. Willoughby had probably gone one degree farther north; but a generation passed away before it was again exceeded, and then by another Devonian, John Davis, in the western hemisphere. It may be alleged that Davis's was a more difficult feat, because the ice descends nearly twenty degrees of latitude lower on the American than on the European side, where the tail of the Gulf Stream sweeps round the extremity of Norway; but, in comparison with the glacial conditions farther east, where Borough was baffled by the ice, this does not apply. Captain Markham, from personal observation on his interesting voyage of last year, says: "The ice in the Kara Sea was excessively heavy, infinitely more so than the ice usually met with in Baffin Bay," and, "the snow lies on the ground in Novaya Zemlya to a much later date than it did at the *Alert's* winter quarters [82° 25'], and the fall of snow is more excessive, judging from my experience of both places."* And he expressly tells us that this was an ordinary year.

Here, so far as the subject of this memoir is concerned, we might leave the quest of the north-east passage. It was not finally abandoned by the Muscovy Company, but Borough was otherwise employed. The Dutch followed, forty years after Borough's time; but never succeeded in getting through the Kara Sea. Barents, in the last of his three voyages, tried the alternative of passing round the northern extremity of Novaya Zemlya; but was frozen up for the winter on the

* MARKHAM, *Proceedings Royal Geographical Society*, January, 1880, p. 20.

coast, and there died. The strait discovered by Borough was unknown to him, and is not shown in the map which he plotted, and which the survivors brought home. Our own Henry Hudson was also baffled in his attempt to pass through the straits leading into the Kara Sea in the year 1608. There is a long interval before the next adventure of the English in search of the passage. The problem and the early attempts of his countrymen became the subject of the pen of no less distinguished a writer than John Milton, who wrote a tract on *Moscovia; or, Relations of Moscovia, as far as hath been discovered by ENGLISH Voyages; gather'd from the Writings of several Eye-witnesses: And of other less known Countries lying Eastward of RUSSIA as far as CATHAY, lately discovered at several times by RUSSIANS*. Whether or not this sketch was the inspiration, at a time when we should least expect to find such an undertaking engaging the attention of the English Government—in the reign of Charles II.—the frigate *Speedwell*, Captain John Wood, was fitted out and sailed, in the year 1676, on a voyage for the discovery of a passage this way to the Indies. Accompanying her was the *Prosperous*, pink, a private mercantile venture of the Duke of York and a few other notabilities, among whom was our old friend Samuel Pepys. It was expected to be a six weeks' voyage to Japan. The result was that, after the usual troubles with the ice, the frigate was wrecked on the west coast of Novaya Zemlya on a rocky point, which Wood, with grim humour, named Point Speedill; and the pink returned at once to England with all hands. The qualifications for geographical exploration which were possessed by this naval captain of the time of Charles II. may be judged from the fact that he did not know whether Novaya Zemlya was an island or joined to the continent, that he thought this incapable of proof, and that the search was impossible, and would hardly be tried. "But let it be either, I think," he wrote, "the matter is not much, since it is the most miserable Country that lyeth on the Foundation of the Earth."* That was the last organized Arctic expedition of the English in search of a north-east passage; since then all their Arctic struggles have been directed to the north-west or towards the Pole. For more than 320 years no advance by sea, beyond that of a few miles, was made upon the farthest point reached by Borough. The Russians, at successive times during the latter half of the eighteenth and the earlier part of the

* *An Account of Several late Voyages and Discoveries*, p. 188. London. 1711.

present century, by land and boat expeditions, surveyed the whole line of coast from the White Sea to Behring's Strait—imperfectly, however, as it now appears; and Admiral Lütke's exploration in 1821-4 seemed to confirm the impracticability of the Kara Sea. All the world now knows that, by the clever adaptation of steam power, and by exhausting every scientific precaution, the passage has been at length achieved by that intrepid voyager and accomplished naturalist, Professor Nordenskiöld, in the *Vega*. For the first time the northernmost extremity of Asia—the Cape Tabin of Pliny—the Promontorium Scythicum of the middle ages—the meaningless North-east Cape of our own charts—the Cape Chelyuskin of the Russians—in lat. 77° 41' N., has been rounded; and the same ship has circumnavigated the whole of Europe and Asia. To follow the incidents of this striking voyage further would be impertinent. The digression into which I have been led by the temptation to complete the history of a project which influenced Borough's life so largely, and which for more than three centuries was the dream of the foremost maritime people of Europe, has already, I fear, been too lengthy.

Four years later Steven Borough again appears in the service of the Muscovy Company, and having charge of a fleet of vessels on a trading voyage to their factory, now successfully established on Rose Island, at the mouth of the Dwina. He was master of the *Swallowe*, of London, the largest of the fleet, freighted with broadcloths, kersies, salt, sack, raisins, and prunes. "One of the pipes of seckes . . . which hath two round compasses upon the bung, is to be presented to the Emperour: for it is speciall good."* He subsequently made several of these voyages as chief pilot in the employ of the company. It must have been in the interval before embarking upon these trading expeditions that a somewhat curious event in the life of Steven Borough took place, which is incidentally mentioned by Richard Hakluyt: "Master Steven Borrows . . . told me that newly after his returne from the discoverie of Moscouie by the North in Queen Maries daies, the Spaniards hauing intelligence that he was master in that discoverie, tooke him into their cotraction house at their making and admitting of masters and pilots, giuing him great honour, and presented him with a payre of perfumed gloues, woorth fine or six Ducates"†—a

* HAKLUYT, vol. i. p. 308.

† HAKLUYT'S *Divers Voyages touching the Discoverie of America*, &c. Epistle dedicatorie. 1582.

peculiarly Spanish compliment. This was at Seville. What was the occasion of Borough's voyage to Spain we are not informed, but it was probably the mercantile business of the company. The Contractation House was a great institution in its day, a sort of Chamber of Commerce founded for the encouragement of navigation, where lectures were given on the art, pilots and seamen were examined, and the general maritime traffic with the Indies was regulated. We shall presently see that Borough brought back with him something of more moment to him than the perfumed gloves. The hostility which existed at a later period between the two nations had not yet sprung up. It is to be suspected that the Spanish authorities, desirous of monopolizing all the nautical ability of the time, endeavoured to entice Borough into their service, as they had successfully enticed Sebastian Cabot before him. They failed to do so, however, if that had been the intention.

The life of Steven Borough divides itself sharply into two periods. We have arrived at the close of the first, which may be termed his sea life, and are now about to enter upon the second, or his shore life. So far we have seen him the practical seaman, following a vain quest through unexplored and dangerous seas, and leading the way fortuitously to new fields of commercial enterprise. We shall now find him, with ripened experience, demonstrating the teaching of his great master, Sebastian Cabot, and one of the earliest of Englishmen to advocate the application of science to the then rude practice of navigation. It was about this time that, at his suggestion, Richard Eden translated the work of Martin Cortes on *The Arte of Navigation, containing a compendium description of the Sphere with the making of certain instruments and rules of navigation: 1561*—a book which, from the number of editions it rapidly went through, must have been widely studied. Profiting further, apparently, by what he had learnt on his visit to the Contractation House at Seville, he embodied his views with regard to the scientific training of English seamen in a dissertation, written by himself, which is preserved in manuscript in the British Museum (Lansdowne MSS., No. 116). This paper, which, I believe, has never yet been printed, is intrinsically curious; and it not only throws much light upon Borough's character and aims, but is also historically interesting for the glimpses which it gives us of what English sailors were like in the first years of Queen Elizabeth's reign, at a time when the maritime spirit of the nation was being awakened (of which there are

not wanting indications in this composition) in rivalry with the enterprise of the Spaniards and Portuguese. These were the fathers of that generation of seamen which five-and-twenty years later met the Spanish Armada in the Channel; and it is questionable, from all accounts, if their sons, much as their pluck and gallantry are to be admired, would have come much nearer to satisfying Borough's ideal. The paper is endorsed "Steph. a burgh," and I venture to give it in its entirety:

"Three especiall causes and consideracions amongst others wherefore the office of Pilott maior ys allowed and estemed in Spaigne Portingale and other places wheras Navigacion florishethe:

"The first is it givethe occasion to make perfect mariners wher as otherwise Navigantes shold haue remained in their accustomed ignorauncye.

"The second throughe their excelencye in Navigacion greate benefyte honor and fame redoundeth to their cuntrey.

"The thirde is that they have no losses of shippes or shipwrake throughe ignoraunce of mariner craft as in other cuntries where the same wantethe it chaunsethe.

"And for better explanacion of the said three causes to the first that it makethe perfect mariners, it is, that there is non permitted to take charge of any of their prime shippes, or any other shippes of charge or chargeable viages vnlesse he haue bine first examined admitted and allowedd by the pilott maior, And haue to shewe his seale that he is allowed to take the name and charge opon him of a pilott or master, (I meane not of the old and approvid good masters and mariners, but suche as dayly of youthe springethe upp:) And yf at his examinacion he be vnsufficient then he to continue in excercise in his mariners craft vntill he be found hable in that behalf by the said pilott maior, And for further declaracion of the premisses yt is to be vnderstand that they haue degries of their Navigauntes as ffolowithe, chifly the pilott, the master, the mariner, the grommett* the page and the boye and eyther of them hathe their estimacion accordinge to their degrie, dewlie observid, whiche good order I wishe in god it were in practisinge in this noble Realme of Englund as we have non the more is the pittie in our Englishe shippes but man and boye, And assone [as soon] as a yonge man runithe to any reasonable stature, he will loke for his age and not for his knowledge to have the name of a man and also of a mariner althoughe he vnderstande litle in the Arte, And so when he can apparell himself like a mariner to haue a whistle and chayne of siluer aboute his necke, and that he can sume thing talke of the Arte, he thinketh then to be a good mariner wheras in deade he is farre from good and necessary knowledge in the same.

[* *Gromwels* or *gromets*: the most servile persons on shipboard. BAILEY.]
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"To the second cause viz. that whereas through their excellency and good order in other Regions in the Arte of Navigacion what wonderfull attemptes they do performe and what habundaunce of Riches and cummodities they bringe into their cuntrey, it is manifestly knowne and dayly seene besides the furniture of skilfull men in those regions, that if it please the prynce and others of habilitie to attempt long viages of discovery or viages vnaccustomed to be travayled, that then they maye be sure to haue men of their owne cuntrey to serve their kinne and not to be constrained to seke into other cuntries for men of skill in that arte when they shall haue nede of them, as hath bene here In England of late yeres to send into spaigne and fraunce for men skilfull in that arte I meyne one of Spaigne the good olde and famous man master Sebastian Gaboto and also pilottes out of fraunce for the gennye viages etc.

"To the third, that they haue no losses of shippes or shipwreke through ignorance of mariner craft yt is because of their dayly exercise in the principles of the arte whiche is to knowe the latitude of the sonne or starres, the variacion of the cumpas with the diuers other sundrye rules and waies wherby they knowe and reckon their shippes waies exactly althoughe the sonne and starres be hid longe from them, and not be seene: whiche exacte rules and reckninges it is the fewest sorte of mariners in this noble Realme of England that dothe practise or seke the knowledge thereof (the more is the pittie) the greatest number of our Englishe mariners contentith themselves with the old Aunshient rules, as they terme it whiche ys erronius enoughe: Albeit ther be sum w^{ch} wold gladly lerne yf they had a teacher, but they whiche knowth more in that arte then the common sorte of pilattes or masters dothe wold not gladly teache other, for hinderinge of their owne lyvinge.

"There are two sortes of pilottes and mastres whiche some they wold gladly be skilfull in the Arte yf they wist howe, And that are these the on sorte of them, because they wold not seme vnakilfull or ingnoraunt in the principle rules of navigacion, therefore they carry instrumentes to the sea with them, belonginge ther vnto, althoughe they be vtterly ingnoraunt in any vse of the same, but they wold gladly lerne, were it not that shame dryvith them to hide their ignoraunce because they haue alredy the name of and preferment of a master or pilott.

"The other sorte are they whiche hath sum thinge practised to observe the latitude eir [?] And when they vnderstand a litle, they thinke they knowe all, And they also thinketh they haue clymmed to the toppe, before they cum to the roote, And hath bene the chifest occasion of the castinge awaye of many mens lyves as well as the losses of Shippes and goodes w^{ch} hath happened to manifestlye within these fewe yeres yf it had bin godes will to the contrary by the cuninge and goinge of our Englishe shippes into Andoloeza sum of them hath perished vpon the coast, others

hathe perished vpon the cape finistere in galisia and also others vpon the strymes [Y] and the coast of Brittain.

"The chifest of these losses (as I am able to approue) hathe hapened through ingnoraunce of the Arte and the presumption of the vnakilfull whiche may be provided for, and remediedd by the appointinge and Authourisinge of a lerned and a skilfull man in the Arte of Navigacion to teache and instructe the said ingnorauntes in the same and not otherwise.

"And because I suppose ther will not lacke suche as will to hinder this my purpose make diuers apparent obiections, against the premisses, I desire that yf any suche be they maye be constrained to put the same in writinge, And I to be called to make Answers for asmuche as the art and science of Navigacion is both excelentt of it selfe, for the knowlege of diuers contreis, landes, peoples and nacions, profitable to realmes, cities and common welthes, by cause that by the same arte the thinges there abowndinge be caried owte, thinges ther Lacking be from other places conueied in: necessare, by cause no common weale neither in peace can floryshe nor in warr maynteyn yt selfe without the same: and fewe or no connyng masters be therof nor no lessons or rules delivered, saving that sum of the spaniardes and portingalles hathe trewlie written in there owne language: whereby greatt losse bothe of mens goodes and lyves hathe thorow the ignorance of the pilottes and masters chaunced, w^{ch} yf the same masters had bene well enstructed and connyng in their office myght thorow good gouernaunce and godes helpe haue ben saved: yt were verye expedient that one man expert and connyng shold be by publique authorite placed and instituted, as it may be commonlye tearmed a cheiff pilott and master, bothe to instruct them that be ignorante, and also to prove that no man take suche charge on hym, but he that is hable to do the thing he takethe in hand. for thorowe ingnoraunce somm tyme it chauncethe, that 3. shippes being in a companye, the masters shall in there opinions dissent and varie: the one saing by my gudgment we are so many Leiges from the land, the other will say in my reckning yt is not so farr, the third will say yt ys further. And this their contention dothe spring of ingnoraunce and lacke of the art. for the art of it selfe is most certeine: And that the excellencie of this arte, and certaintie may be knowen, I haue thought it good, to note brieffiye these (3) thinges folowing.

"1. The first is that it is an arte of subtiltie, w^{ch} dothe conteyn not onely experience, but requirthe knowlege.

"2. The second is, that yt ys an art of certaintie, yf they w^{ch} do professe it do attein the knowlege.

"3. The thirde is, that great commoditie and profit, wth honor dothe rise vnto common wealls thorow this art.

"To the first it may be said that it hathe a subtiltie so great, that a man wth a pear of compase and certayn lygnes drawn vpon

parchmentt, paper, or suche lyke, may make discripcion of the whole worlde, w^{ch} is generallye called cosmographia as well the water, whiche is called gydrographia as the earthe whiche is called geographia : and knowe bothe by day and nyght the way and corrs whiche the shippe hathe gone, aswell as that she hathe to saill, for the accomplyshment of her iourneys. And howe certaine a thinge it is to know by this arte howe to sayle and passe a thing beinge so lardge in space, as the sea is where there is no way to be perceived nor sygne thereof. The truthe is, it ys a thing verie subtile and difficult as Salamon did consider it sayng, it is a difficult thing to fynd the way where a shipp hathe passed throwghe the sea, by cause ther followth no way to be sene, nor no signe thereof. And what more subtiltie is to be spoken of, Then that w^{ch} a rownd Instruement so broad as your hand, called an astrolobe, then may be measured the heaven, nott wth standing the greatnesse therof. w^{ch} the vnderstanding of man cannot reach vnto And wth this to take the altitude of the sonne passing by a verye small and subtile hole or place, hit being manifold greater then is all the sea and lande And to know by it how farr it is from vs : And lyke wyse to tak the latitude by the starres, and these dothe teache and guyde vs so certayne, that ther is no point wanting. Also who is able to declare the subtiltie and worthines of the saylyng compas. The flece or bruxula therof being made of a peec of paper so broad as the palme of a mans hand (little more or lesse) and wth certaine lygues drawen vpon it, w^{ch} representethe the wyndes, and also wyth a peec of wyer fastened in the bottom thereof maketh an Instruement whiche will move by it selfe, by a naturall vertew that a stone called a load stone stirring and moving the said wyer, it will shewe the east and west, south and northe, and lyke wyse all the rest of the 32. wyndes poyntes w^{ch} apperteyneth vnto navigation, not onely in one place, but in all places : and teachethe so certayne that it gevethe lyght and certayntie to all navigaunttes.

"2. To the seconde. The arte is of suche certieintie, that it is not sufficientt to learne it of one man or many men, except almyghtie god geve it of his especiall grace and devine inspiracion (as wrytethe pedro de medina* in his book of navigacion) w^{ch} is approvid that a pylott in his reckning navigating, metethe wth a storme 300 leages in the sea, the day beyng verye much overshut wyth clowdes and mystes and also the nyght so extreme dark that a man standing in the poepe of the shipp, shall not see the foarshipp and scantlye the mastes : gevyng many bueltas and turnes in the sea, runnyng from one part to an other, heaving and setting wth the vehemience of the wyndes, and force of the seas ; not wth standing all these, by the certeyntie of the art, the expert pylott shall knowe the way that the shipp hathe gone, and the plac wher he is, and also trulye howe to direct his cource wth the land wher he dessyrthe to tak his

[* PEDRO DE MEDINA. *Arte de Navegar*. The first edition published at Valladolid, 1545, is probably the one referred to by Borough.]

port, althowghe in the nyght and that he can see no land : Also it happenethe wth the pilott sum tymes in his greatt travaylle, that he metethe wth dawngeres of rockes or sholdes 200 leiges in the sea, from any land and yett by the art he shal be hable to marke the place where that dawnger is ; in suche maner that bothe he and others at anye tyme may avoyd the perill thereof : albeit that it is difficult to do, by cause onelye he seethe but the heaven and water, and in them it is not to be marked, or sygnes to be geven there of, by cause theye be moveable. But it ys to be marked in his caertt by the land w^{ch} he seethe therein placed, and conferryng the arte w^{ch} the caertt, it conteynethe suche certainte, that he and others, bothe by day and nyght, may understande howe to beware and a voyde these dawngers, that he or theye receive no perill ther of, and thus I conclude that althowghe other artes haue truthe—This more—by reason of the certayne demostracion that it hath, the w^{ch} teachethe a man to be ware of the perillows dawngers whiche he seethe nott.

"3. To the thirde I saye. there is no art that is so profitable vnto man, as is the art of navigacion And to prove that this is true, it well apperethe and is manyfest, by cause that by it is vnderstand and noted the differences, and varieties that are in the worlde. And also the tractes and comunicacions in all the partes of the vniverse, and thus yf that navigacion shulde cesse, verye streatlye shulde men lyve, by cause there shuld lack manye thinges w^{ch} are necessarye for the lyfe of man & it is muche to be noted that emongst all the artes that men vse, or that they are hable to talke of, Ther is none so dawngerowse, and labowsom as is the art of navygacion. And especially nowe wth in these fewe yeares, there is so muche enlarged, that well neie the roundnesse of the world is navigated : Oh most happye and blessed tyme of these owur daies, whiche not for dread of death nor feare of hungar and thirste, nor yett the extreme colde and most dawngerows yce, wth others Innumerable paynes all these are not sufficientt to cawse men to leave navigating and sekyng to discover vnknown landes, by w^{ch} meins the secrettes of the world com to lyght, and well nere the circumference of the whole earthe knowen The whiche the Antiques in Awnshient tyme, nyther sawe nor thought on : but rather thowght it impossible to reache ther vnto. It is a thing worthie to be notid, whiche is manye tymes seen That the pilottes returnyng from there dawngerows travayle, and passing the perills so narrowlye, that in maner deathe is present before there eyes yett whan they returne to there naturall cuntrye all these perills are forgotten, and passethe a waye as dothe a dream and procurethe agayn the lyke vyage wth as goode a will as thowgh there were onelye pleasure there in : It is not to be thowght that covetownes or anye other humayne thing cawse this but rather yt ys to be thowght that it is the devyne working of the holye ghost to have it so And althowghe it be a thing so naturall to fear deathe and this most laboursom

travayll all these fears that are in navigacion, passe a waye, are forgotten, and no more called to remembrance: for yf the feares passed should eftsones be called to remembrance ther wold be fewe dessyrows to navigate.

"The office of a pilott is suche that it maye be resembled vnto the office of a minister of byshoppe: for as the one hathe charge of sowles, So hathe the other charge of lyves and goodes committed to his creditt, The one traveylethe to the port of heaven the other to a port on earthe.

"To counclde seing this art is of such profownde knowlege and subtiltie, of assured certaintie to them that be skillfull, of suche great commoditie to commen wealls and cities, It were very expedient, that a learned pilot maior were placed in that office, whiche thorow his enstruccion, may further, theym that be learned, and enstruct them that be vnlearned, foar see that no man take suche offyce on hym, but he that is sufficient and hable."

In the same volume of MSS. is an equally interesting paper, which is, apparently, a copy of the commission subsequently given to Steven Borough himself, in accordance with his own patriotic suggestions. This is endorsed: "3 January 1563. Stephen a Burgh: office of Cheif pilott of England."

"Elyzabethe by the grace of God [&c.] For the advoying of dyvers great perills and dawngers aswell the Losses of shippes and goods, as mens lyves, wh our welbeloved subiects have yere tofore manye wais and yet doe daylye susteyn and incurre throwghe the presumption of the unskillfull pilott or master: Therefore we think it good for the redresse thereof To appoynte a man skillfull in maryne affaires to be the Cheyffe pilote of this our realme of Englande, w^{ch} cheyffe pylott shall have the examynacion and appoyntyne of all such maryners as shall from this tyme forwarde take the chardge of a pilott or master upon him in anye shippes w^{ch} in this our realme that shalbe of the burden or portage of fourtye tonnes and upwards. And for the speciall knowledge sight and experience in Navigation, w^{ch} we have reposed in our &c. Stephen Borowghe we have geven and graunted, and by these presents for us our heires and successors do geve and graunt unto the said Stephen Boroughe, the office and rowme of Cheyffe Pilott of this our realme of Englande as afore said we make ordeyn and constitute by these presents, to have, holde, exercyse, occupye, and enioye, the office and rowme of Cheyffe Pilotte unto the said Stephen Borowghe, by hym selfe, or his sufficient depute, or deputies, during the naturall lyffe of the same Stephen, and that no man hereafter, take on hym the office of a mariner, before he be examyned, allowed, and authorysed by the cheyff pilott, or his sufficient deputte upon payn of the forfaytt of xxs of good and lawfull monye of this realme of England, the one halff thereof to the L. Admyrall for the tyme beyng, and the other halff to the

cheyff pylott. And that when he is allowed a man meytt for his knowledge to that rowme, that he have the testimonye of the Cheyffe Pylott, or his sufficient depute or deputeis, in wryting (and signed with his or their seall, afore he be admytted and accepted to the exercyse of that office) and also that no man here after take on hym the office of a Boteswayne, quarter master, or masters mate, who is nott before examyned, approved and allowed (as is afore said) worthy to be a mariner: And that he maye before he be allowed a maryner eyther serve an other man skillfull as his prentis (according to the use manner and custome of this our realme) or els to serve as a boye page or gromett. And also that no man here after take on hym the office of a Pylott or master, which hath not before been approved and served in the office of a mariner namely Boteswayne quart'master or masters mate upon payne of the forfayt of xls of lawfull monye of Englande, the one halffe thereof to the L. Admyrall for the time being and the other halffe to the cheyff pylott And that he be allowed and admytted onely to suche office by the cheyff pylott or his sufficient and speciall deputie. So that at his admyssion he be examyned before two other that be skillfull in that art, if such may be had, or els the cheyff pylott alone or his depute, may appoynt hym yf he fynd hym meytt. And that the cheyff pylott both at the admyssion and approbacion of the maryner, and also of the pylott or master, do geve rules and Instructions towching the poynte of navigacion and at all other tymes to be redye to enforme him that seeke knowlege at his hande."

The powers given to Borough by this commission may be considered extraordinary—they show in what consideration he was personally held, and the favourable aspect in which his proposals had been viewed. We are left to conjecture what was the influence which brought Borough into this prominent notice, and I think it is not far to seek. Among the notabilities who, upon the first success of the Merchant Adventurers, eagerly joined them on their being incorporated was the Lord High Admiral, William Lord Howard of Effingham. He was a better sailor than his more distinguished son, the Lord Admiral of the time of the Armada, and, as Fuller says, was "one of the first favourers and furtherers, with his purse and countenance, of the strange and wonderful discovery of Russia." To him Borough and his qualifications were, of course, well known. That it was provided that the Lord Admiral should share the fees is, to say the least of it, suggestive. A statement made by Hakluyt, in which he has been followed by others, that the office of Chief Pilot of England had been previously held by Sebastian Cabot, under a patent from Edward VI., is controverted

by the erudite and critical author of the *Memoir of Sebastian Cabot* (Mr. Biddle, to whom we are so much indebted for our knowledge of that remarkable man,) who has cogently argued that it is disproved by the memorial (if it may be so called) of Steven Borough, who was personally acquainted with Sebastian Cabot, and must have been well aware of the fact if it had been so. "It seems difficult," he says, "to reconcile the language of Borough with the previous existence of any such office." The patent, in fact, does not mention any office at all; but grants a pension to Cabot for good and acceptable services "*impensi atque impendendi*"—"constituting him," as Hakluyt puts it, "grand pilot of England;" from which I infer that Hakluyt only meant that the general supervision of English maritime affairs with which Cabot was entrusted was of a similar kind to, and a reflection of, the office which he had formerly held as Grand Pilot of Spain. There are no further traces of the history of the office thus conferred upon Borough, and it is not unlikely that it was found impracticable, and soon fell into desuetude. That the ideas from which it originated were far in advance of the time may be judged from the fact that it has been only within living memory that the functions of Borough's office, so important to a maritime state, have been revived and assigned to a Government department.

The commission which I have, in part, transferred to these pages goes on further to—

"Appoynt the fore said Stephen Boroughe to be one of the foure Masters that shall have the keepyng and over syght of our Shippes in medowe [Medway] water that is to saye at Gellingham Chattham &c." [the rest provides for the payment of "wages"—sum not stated.]

There appears to be nothing exactly analogous to this office in the naval employment of the present day, unless it be (as has been suggested to me) that of the masters-attendant of the several dockyards—which, however, would seem to be scarcely so comprehensive.

We know but little of Steven Borough's 'long-shore life which now follows for twenty years; it was probably uneventful, and passed mostly at Chatham, the scene of his official duties as one of the masters of the navy. Chatham was then the principal dockyard and station of the Royal Navy—such as it was. According to Pepys, in 1565, two years after Borough's appointment, it comprised only "twenty-nine ships and vessels," the whole of which were in that year laid up in

ordinary; and Harrison, in 1577, states, "That the Queen's highness hath at this present already made and furnished to the number of one and twenty great ships, which lie for the most part in Gillingham road [close to Chatham.]"* The period of twenty years over which Borough's duties extended was not a stirring one for the navy. But there were troubles in Ireland, and a squadron was sent to the coast under Sir William Winter which took part, and with little credit to Englishmen, in the affair at Smerwick. The time soon came when the din of preparation for the long-impending and inevitable conflict with Spain rang through the yards on the banks of the Medway; but Borough had passed beyond its sound. In the years over which this part of Borough's life extended, the taste for geographical discovery, instead of abating, pervaded more vehemently the curiously scientific minds of the day, and the North-west Passage comes fully uppermost as one of the crazes of the period. From Richard Thorne, of Bristol, to Mr. Oscar Dickson, of Gothenburg, there have never been wanting enthusiasts in geographical science who, not being themselves navigators, have munificently aided those who were ready to embark on voyages of discovery. Such a man was Michael Lok, who, at the same time that our fellow West-countryman, Sir Humphrey Gilbert, then it appears living at Limehouse, was putting forth his *Discourse of a Discoverie for a new passage to Cataia, 1576*, and when many others were discoursing on the same attractive theme, was chiefly instrumental in organizing the voyages of Martin Frobisher. Steven Borough, representing the Muscovy Company, whose exclusive rights were supposed to be involved, was in frequent conference with Lok and Dr. Dee, who, with their "bokes, cardes, and instruments" before them, planned out satisfactorily to themselves the course to be followed. Borough, however, does not appear to have been very favourable to the enterprise, and refused the invitation to join in it as treasurer. The attempt, of course, failed, and the failure was inglorious. The energies of Frobisher, after his first voyage, were diverted from the search for the passage to Cathay by the allurements of certain imaginary gold ore which had been found on the coast of Meta Incognita; but the ore which was brought home by the fleet dispatched for it proved to be almost worthless, and the adventurers, from the Queen's Majesty downward, lost their money.

To the interesting question which might be asked—Did

* See *Notes and Queries*, 2nd Series, vol. xii. p. 239, where these passages are quoted.

Steven Borough ever re-visit the scenes of his youth in North Devon?—I am unable to give any answer. He died in 1584, in the fifty-ninth year of his age, and was buried at Chatham. The parish church of St. Mary, Chatham, stands upon an eminence above the Ordnance Wharf. It was built about the year 1788, on the site of an older one which seems to have had some good architectural features, and fragments of Norman work have been incorporated with the modern structure. The present church is described by Brayley* as “a neat edifice of brick, nearly square.” Add to this—period, end of the eighteenth century, and the ecclesiologist will be able to complete the picture. Still, the church is not without interest. The interior is full of memorials, chiefly of successive dockyard officials, and of the seventeenth and eighteenth centuries, replaced from the older building; the earliest of all is one which is affixed to a floor-stone in the body of the church, near the chancel, over the grave of Steven Borough. It is a small brass plate of the dimensions 20½ in. by 11 in., and on it, clearly cut, and in fair preservation, is the following inscription :

Here lieth buried the bodie of Steven Borough who departed this life y^e xijth of July in y^e pere of our lord 1584, and was borne at Northam in Devonshire y^e xvth of September 1525, he in his life time discovered Musconia by y^e Northerne sea passage to S^t. Nicholas in the pere 1553: At his settinge forth of England he was accompan... with two other shippes, Sir Hugh Willlobie beinge Admirall of y^e fleete, who with all the Company of y^e said two shippes were faine to death in Lappia y^e same winter. After his discoverie of Rootia and y^e Coastes there to adiopninge, to wit Lappia Douazemla and the Cuntre of Samopeda &c: hee frequented y^e trade to S^t. Nicholas perlie as chiefe pilot for y^e voyage, untill he was chosen for one of y^e towre principall masters in ordinarie of y^e Queens Ma^{ties} royall Naue, where in he continued beinge employed as occasion required in charge of sondrie sea services till time of his death.

A doubt has suggested itself to me whether the words “in charge of sondrie sea services,” at the end of this epitaph, allude to some further voyages upon which Borough embarked in the latter part of his life; but as such a supposition would scarcely be consistent with the idea of the stationary nature of his employment which his commission

* *Beauties of England and Wales*, vol. viii. p. 672.

implies, I am inclined to think that the words are not to be so construed, but that their more obvious meaning is, that he organized and despatched certain expeditions to sea, but did not himself command them.

This account of Steven Borough and his writings must now be brought to a close. It is as connected as I have been able to make it in the absence of any other known vestiges of his career, and has been compiled not without danger from literary pitfalls made by writers who have confounded Borough with others of the same name.* In it I have endeavoured to rehabilitate a prominent seaman of the days of King Edward VI. and Queen Mary, who, in the bracing air of the Arctic seas, first developed the more sterling qualities of the English sailor; afterwards the enthusiastic scientific navigator who, on the eve of the great step towards maritime ascendancy achieved by his countrymen in the later years of Queen Elizabeth's reign, was urging in his quaint fashion—we know not with how much or how little effect, only that an attempt was really made to put it in practice—the better technical education of English seamen. That Steven Borough was a Devonshire man, and his biography a neglected one, is, of course, the special reason for my preparing this paper, and desiring to submit it, such as it is, for a place among the literary gleanings of our Association.

It would have been difficult in this paper to have avoided some passing reference to William Borough, so much is the story of his life mixed up with that of his brother's. Besides the brief notices of this not undistinguished Devonshire seaman which I have already introduced I may add the following: Engaged in several trading expeditions in the service

* In Captain A. H. Markham's extremely valuable book, *The Voyages and Works of John Davis*, which he has recently edited for the Hakluyt Society, there is an unfortunate paragraph with reference to Steven Borough. (Appendix, p. 356.) In this occurs the following passage, which is full of errors: "He was afterwards one of the four principal pilots in ordinary of the Queen's Royal Navy, and conducted the fleet, with Leicester's expedition, from Harwich to Flushing, in 1585. His interesting account of this service has been printed by the Camden Society in the volume of Leicester's Correspondence. He died on July 12th, 1586, and was buried in Chatham Church, aged 60." Whoever the Stephen Burrough may have been who was admiral of the fleet which sailed from Harwich in December, 1585, (and this I will not stay to enquire), it is certain that he was not Steven Borough, the subject of this memoir, who had undoubtedly died in 1584, nearly eighteen months before. If the date on the brass on Borough's grave is not sufficient, the following extract from the parish register of Chatham will be conclusive: "In Chattham. Julie 1584. Stephen Bourouge Esquire was buried the xijth Daie of y^e same monthe." Captain Markham should have been warned by the parallel coincidence of the two John Davises which had confronted him in his own work.

of the Muscovy Company, when captain-general of a fleet of thirteen merchantmen on a voyage to the Narve, in the Baltic (then a newly-opened port of the Russians), in the year 1570, he gallantly attacked six "strong and warrelike" ships of the Danish "freebooters," or pirates, which had lain in wait for him, capturing them with their captain, Hans Snarke—a thorough viking with a halo of romance about him. He afterwards became Comptroller of the Royal Navy—"a worshipfull gentleman," as Stow calls him—in which capacity he had some official quarrels with John Hawkins, who was treasurer at the same time. He drew up some admirable instructions for the guidance of explorers to the north-east, whither, as I have before stated, he had accompanied his brother on two voyages of discovery. He had an eminently scientific mind, was an authority on the subject of the magnet, and published *A Discours of the Variation of the Cumpas, or Magneticall Needle. Wherein is mathematically shewed the maner of the obseruation, effectes, and application thereof, 1581*, which was frequently reprinted. He was also the author of "An exacte and notable mappe of Russia, briefly containing (amongst other matters) his great trauailes, observations, and experiments both by sea and land, especially in those North-eastern parts,"* of which only the *Dedicatorie Epistle* to Queen Elizabeth, from which I have quoted,† seems to have survived.

* HAKLUYT, vol. i. p. 417.

† See *ante*, p. 332.

RECENT GEOLOGICAL DISCOVERIES IN THE NEIGHBOURHOOD OF PLYMOUTH.

BY R. N. WORTH, F.G.S.

(Read at Totnes, July, 1880.)

I PURPOSE in this paper simply to put upon record in a general way a few facts of interest in connection with the Geology of the neighbourhood of Plymouth, which have come under my notice within the past eighteen months, and which have been followed up to the present time.

My notes relate to two topics:—(1) The character of the rocks of the Eddystone reef, as revealed by the operations for the construction of a new lighthouse, and the proofs which I have been fortunate enough to discover of the wide extent of the formation to which they belong; and (2) the progress of research in connection with the ossiferous fissures of the limestone of Plymouth and its vicinity.

Recent operations at the Eddystone have shown how careful an observer the late Mr. Prideaux, the first systematic writer upon the geology of Plymouth, was. He describes the Eddystone reef in the following terms:—"Southward, no further distant than the Eddystone, we again find the granite . . . one rock, on which stands the lighthouse, and that one only, is of gneiss." Elsewhere he speaks of the "house-rock" as a "single rock, probably 200 feet square," and the three specimens from the Eddystone which he deposited in the museum of the Plymouth Institution,* consisted of an example of this house-rock gneiss—"2 ditto, passing into granite, 3 granite"—his note on the latter being, "The rocks nearest the gneiss contain the largest amount of felspar, and have the most laminar texture."†

* They are not there now.

† "Geology of the Country near Plymouth." *Plym. Inst. Trans.*, 1880, pp. 40 and 44.

The new lighthouse is being erected on a rock to the south of the "house-rock," and a considerable portion of this has been removed in levelling for the foundations of the new building. Although the area is small it has afforded examples in every stage of gradation, from what we may regard as the typical gneiss of the "house-rock" to pieces which in hand-specimens cannot be distinguished from the common red granitic veins of Dartmoor, the felspar and the quartz largely predominating. A thin vein of compact glassy quartz also traverses the rock immediately beneath the centre of the new tower. Probably none of the Eddystone rocks can be regarded as in the ordinary sense typical gneiss or typical granite, but they partake of the characteristics of both in a very curious and oftentimes puzzling way.

Mr. Prideaux was, I believe, the first who identified the gneissic character of the Eddystone rocks, as he was also the first to indicate their granitic features. He believed the gneiss of the Eddystone to be "the only gneiss in England";* and it has generally been regarded as at least the only instance of the occurrence of this rock in the West of England. Some twelve years since, however, an isolated fort was erected immediately within the Plymouth Breakwater, on the Shovel Rock, and in the course of the works portions of that rock were removed. Some of them were preserved, and a few months since passed into my possession, when I was astonished to find that they were as distinctly gneissic in character as the most gneissic of the Eddystone examples.

Prior to the erection of the Breakwater the Shovel Rocks were a formidable impediment to the navigation of the Sound, entirely closing against large ships a considerable part of the middle entrance; extending about 1,200 yards from east to west, and having an average breadth from north to south approaching 500—the depth of water at low tides ranging from under three fathoms to five. The fort is built towards their western extremity, where the water is the shallowest. These rocks thus form, it will be seen, no unimportant item in the submarine geology of Plymouth Sound, and the probability is that the whole of the reef is of gneissic character. No such rocks occur on either shore of the Sound, but the strata there are such as to lead to the conclusion that they have been subjected to great disturbance.

The "contortions and displacements" of the rocks on each side of the Sound, have indeed been noticed by every geologist who has written upon the district, from the time of

* *Op. cit.*, p. 44.

Mr. Prideaux's paper downward. Sir Henry de la Beche, writing on these beds, says that "they are much twisted, the contortions being probably due to the causes which produced the intrusion of a porphyritic rock that occurs in mass on the north of Cawsand."* Professor Phillips, describing the beds on the east of the Sound, by Staddon on to Bovisand, speaks of the contortions as "amazing."† The late Professor Jukes grounded upon the contortions and inversions which he observed in the same locality one of his strongest arguments for the inferiority of the Bovisand sandstone and associated rocks to the limestone.‡

We can hardly, I think, now fail to recognise it as at least highly probable that these inversions and contortions are due to the upheaval of the rocks of the Shovel Reef. But whether we accept that speculation or not, the discovery of the true character of these rocks is an important element in our local geology. Until a few months since, the Eddystone offered the only direct and unquestioned evidence of the existence of a granitic Channel outlier. Last year, however, the occurrence of blocks of granite on the Salcombe fishing grounds, added considerably to the weight of "the hypothesis of a submarine granitoid formation" of considerable extent, off the southern coasts of Devon and Cornwall.§ And the discovery of the gneissic character of the Shovel Rocks conclusively proves that the Eddystone Reef is no isolated phenomenon, but part of an extended granitoid formation, which occupies the entire area between Plymouth Breakwater and the Eddystone, a distance of 11 miles from N.N.E. to S.S.W., and in all probability skirts the coasts of Devon and Cornwall, and stretches into the Channel, for a much greater distance. The existence of a submarine granitic area, probably comparable in extent with Dartmoor and the other well-known granitic districts of this western peninsula is, therefore, no longer an hypothesis, but an established fact. The Shovel Rocks are about six miles to the north of the line of strike of the metamorphosed rocks of the Bolt Head district.

My remaining notes are but brief, and refer merely to the recent occurrence of ossiferous fissures in the neighbourhood of Plymouth, with which I hope to deal more at length on a future occasion. Last year, a cavern at Yealm Bridge, which was stated by old workmen to be a branch of that explored

* *Report Dev. Cor., and W. Somerset*, p. 65.

† *Palæozoic Fossils*, pp. 201-202.

‡ *Notes on Parts of S. Dev. and Cornwall*, pp. 18-22.

§ *Vide* papers by A. R. Hunt, F.G.S., and W. Pengelly, F.R.S., F.G.S. *Trans. Dev. Association*, vol. xi., pp. 311-342.

by Mr. Bellamy, yielded a small quantity of bones, including remains of the hyæna and bear. Of the latter there was a fine ramus of the lower jaw (left) with the canine and three molars. Teeth which by the description were horse were also found. The fissure was near the top of the quarry; and the bones were discovered next the rock on one side in clay.

Other fissures, in the Plymouth limestone, have yielded during the past twelve months, but in small quantity, bones and teeth of rhinoceros (*tichorinus*), bear, hyæna, wolf, aurochs, ox (*primigenius* and *longifrons*), horse (fossil), ass, sheep, hare, red-deer, reindeer, pig, fox, and a small rodent, &c. Of these the reindeer has never been recorded in the Plymouth district before; and is now for the first time definitely added to its cave fauna. Most of the bones were found in clay; some in apparently surface earth; a few were encrusted in stalagmite. Associated with them were a few flakes and chippings of flint—patinated—some unmistakeably worked, and worn by use.

RECENT DISCOVERIES IN THE PARISHES OF CHAGFORD AND MANATON, DEVONSHIRE.

BY W. PENGELLY, F.R.S., F.G.S., &c.

(Read at Totnes, July, 1880.)

PREFATORY.—Chagford and Manaton being included in the group of Parishes which together make up “Dartmoor,” as defined by the Resolution of the Council of the Devonshire Association (See *Trans. Devon. Assoc.*, xi., 28), this communication was offered to the Dartmoor Committee, through Mr. W. F. Collier, their Honorary Secretary, for incorporation in their Report. Mr. Collier, however, suggested that it should rather be submitted to the Council of the Association for acceptance as an independent paper; and as there did not appear to be any objection to it, the suggestion was acted on.

I. KISTVAENS IN THE PARISH OF CHAGFORD:—In May, 1879, Mr. Samuel H. Slade, of Torquay, member of this Association, informed me that he had recently found two stone graves, or kistvaens, in the parish of Chagford, Devon; and, in compliance with my request, he was so good as to hand me, soon afterward, the following written statement on the subject:

“Torquay, 9th June, 1879.

“In November 1878, whilst at Thornworthy in the parish of Chagford, I came upon a mound composed of stones varying from 7 to 56 lbs. in weight, and mixed with black earth. The mound was circular, about 30 feet in diameter, and having an elevation at the centre—the highest point—of from four to five feet.

“Being convinced, by a short examination, that it was a cairn, I secured the consent of Mr. Robert Standerwick, the owner of the estate, and proceeded to investigate it with pick-axe and shovel. We began at the centre, where, after removing stones and soil to the depth of a foot and half, we came upon a large flattish block of granite. This we entirely uncovered; and then, by working round it and to a lower

level, we found that this block was a cover to four blocks standing upright on their edges and forming what appeared to be a rectangular, oblong chest. After clearing away the rubbish sufficiently, a crow bar enabled us to throw off the cover, which I estimated to be at least 600 lbs. in weight, and thereby to expose—just what we had expected—an old grave. It was filled, to within 6 or 8 inches of the top, with very black soil, which in fine weather would have been light and friable. This we removed as carefully as we could, but the weather being very inclement, heavy squalls of wind and rain coming on every five or ten minutes, the soil came up so wet and pasty that we could not thoroughly examine it, and we found no object of interest in it. As I had to return to Torquay the next day, nothing further was done at that time.

"Some weeks afterwards I made another visit to Thornworthy, and resumed the investigation of the mound. I first sifted the soil we had previously thrown out of the grave, and found in it a flint implement only. We then, by removing more of the materials composing the cairn, came upon a second grave. It was of very much the same size and shape as the former one, viz., about 4 feet long, 2 feet wide, and 2 feet deep.

"After clearing away the soil and stones all around it, we decided not then to remove the cover, but to invite Mr. Pengelly to make a personal investigation of it. In this, however, we met with a disappointment, for during the absence of Mr. Standerwick, for two or three days, some one lifted off the cover, and threw out the contents. We afterwards sifted and raked these over, and found a portion of a rude, handmade, sunbaked urn, but nothing else. We found subsequently, however, in the same materials, after some days' exposure to heavy rains, two small flint chips or tools.

"A considerable portion of the cairn remains unexplored, and I propose to satisfy myself, as soon as I can, whether or not it contains any other graves.

(Signed) SAMUEL H. SLADE."

I accepted most gladly the invitation of Mr. Standerwick and Mr. Slade to visit the cairn as soon as the weather was sufficiently settled for work on a Dartmoor hillside. Settled weather, however, was a very rare phenomenon during the so-called summer of 1879. The June and August of that year were the wettest that had occurred in Devonshire during, at least, 16 years, and though the July was not thus distinguished, its rainfall exceeded the average for that month in the ratio of 5:3.

On the 8th of September, however, Mr. Slade wrote me from Thornworthy, stating that he had finished his inspection of the cairn, but had found no more than the two graves already mentioned.

On the 13th of the same month I had the pleasure of visiting the spot, when I found that the outline of the cairn was still distinctly traceable, and that the side-stones and end-stones of both graves were standing in the ground precisely as they were found. Aided by Mr. Standerwick, Mr. S. H. Slade, and Mr. H. Rowe, of Torquay, I drew up the following statement:—

Thornworthy, the residence of Mr. R. Standerwick, in the parish of Chagford, is about 2·5 miles, as the crow flies, from the “church-town,” and not quite half a mile from Thornworthy Tor, from which it bears slightly east of south. The cairn was on the hillside between Thornworthy house and the left, or north, bank of the South Teign, and about 180 paces from that stream. It consisted of pieces of granite, elvan, schorlaceous rock, quartz, and metamorphosed strata, many of them more or less rounded; and the whole was covered with grass and such small plants as occurred on the adjacent moorland. The cairn was sensibly circular, and as nearly as possible, 30 feet in diameter. From the centre, where it reached its maximum height of about 4 feet, it sloped pretty uniformly in all directions. It was not protected or defined with any stones placed around its margin.

The graves differed a little in size. The centre of the larger was coincident, or very nearly so, with that of the cairn. The smaller grave was a few feet south and east of the larger, and, on account of the natural slope of the hill, at a rather lower level. The stones were all of granite, and set in the ground, on their edges, in a sensibly vertical position with the exception of the southern side-stone of the larger grave, which inclined slightly inwards, that is towards the opposite side-stone, and their upper edges were sensibly horizontal, and, in each grave, reached the same level. Each side and end consisted of one single stone. In the larger grave, the northern side-stone and the western end-stone simply met at their inner edges—neither of them overlapping the other,—but in all other cases the stones at the ends were overlapped by those at the sides. In the larger grave, at the end where, at one of the angles, the adjacent stones met simply, as just stated, there were two parallel stones, the outer one leaning against the inner as if to keep it in position. There was no other instance of what may be called a supporting stone.

Neither of the graves was strictly a rectangle or even a parallelogram; thus, the internal measurements of the larger were, length 43 inches on the southern side, 40 inches on the northern side, and breadth 22 inches from end to end; whilst those of the smaller were, length 38 inches on the southern side, 37 inches on the northern side, breadth 22 inches at the western end, and 20 inches at the eastern end; the depth of each was about 13 inches. The bottom in each, and throughout, was the unbroken surface of the moorland and of a light brown colour.

The graves were by no means placed in parallel lines, for whilst the direction of the north side-stone of the larger grave was from N. 20° W., mag., to S. 20° E., that of the smaller was from N. 50° W. to S. 50° E.; the directions of the corresponding sides were therefore inclined at an angle of 30°. Taking the variation of the compass at 20°, the length of the larger grave was in the direction of N. 40° W. to S. 40° E., true, or N.W. to S.E. nearly; whilst that of the smaller extended from N. 70° W. to S. 70° E., true, or W.N.W. to E.S.E. nearly.

Mr. Standerwick being so good as to present to the Torquay Natural History Society whichever of the graves I preferred, I selected the smaller one; but the stones of both were allowed to remain in the ground exactly as they were found until 15th March, 1880, when those of the smaller grave were dislodged under the superintendence of Mr. Standerwick and Mr. Slade, and on the 17th of the same month were received at the Society's Museum at Torquay, where they have been inserted on their edges in the basement floor, so as to show the exact original form and dimensions of the kistvaen. The Coverstone, which has also been replaced, is tilted, so as to enable visitors to see the interior.

The stones are all thin natural slabs such as are easily obtainable from the granites of Devon and Cornwall, which have a tendency, as was long ago pointed out, to be divided or cleave in a stratiform manner. (See De la Beche's *Report*, 1839, p. 163.) They appear to have been not "tooled" or prepared, but merely selected, for the use to which they were put. It is true that the upper edge of each of the standing stones is almost sensibly straight, but in all probability these edges represent nothing more than the well-defined joint planes so common in the Dartmoor granites. The Cover Stone is an irregular pentagon, in which each side represents a natural joint. The Cover Stone of the larger grave is much less symmetrical in outline.

The following Table shows the principal facts respecting

the size and weight of the stones of the smaller grave, now in the Museum at Torquay. In calculating the weights, the specific gravity of granite was taken = 2·662. (See *Ency. Brit.*, 8th Ed., 1856, vol. xii. p. 88.)

Stones.	Greatest Length in inches.	Greatest Breadth in inches.	Thickness in inches.	Area of each face in sq. feet.	Volume in cubic feet.	Weight in cwt.
Cover . . .	60	34	9 to 5	10	5·8	8·6
North Side .	51	30	4·75 to 2·5	8	2·7	4·0
South Side .	62	37	6 to 5	10·5	4·8	7·1
East End . .	38	19	6·5 to 3·5	6	3·9	5·7
West End . .	34	25	6·5 to 4·5	4	1·8	2·7
Totals . . .				38·5	19·0	28·1

The stones were inserted in the ground so as to have their greatest lengths horizontal in the case of the side stones, but vertical in that of the end stones.

The materials taken out of the larger grave were chiefly thrown between it and the smaller one, discovered subsequently; and when the north side-stone was dislodged on 15th March, a flint implement was found among these materials; and Mr. Slade entertains no doubt that it was primarily among the contents of the larger grave.

It will be seen from what has been stated that of the four flint tools found within the cairn, one belonged certainly, and another probably, to the contents of the larger or northern grave; and the remaining two to the smaller or southern one, now in the Museum at Torquay, to which the earthenware vessel, of which fragments have been recovered, also probably belonged. The dimensions of the graves render it most improbable that they were ever occupied by human skeletons, and this view is borne out by the absence of any fragment or trace of bone. Whether the trespassers who opened and emptied the smaller grave found within it any other object of interest we have no means of knowing, and, unfortunately, we are equally ignorant respecting the condition in which they found the earthenware vessel, as well as the position in which it was placed.

Mr. Standerwick has been so good as to allow me to study the implements and potsherds mentioned above. The imple-

ments are all of the same kind of flint, which has a very dark gray or almost black colour, and a hornlike aspect. It is slightly translucent at the edges, where these are thin.

The specimen certainly belonging to the larger grave, found in November, 1878, has a considerable "bulb of percussion" on one face, which, on the whole, is rather convex, whilst the opposite face is slightly concave. In outline it is quadrilateral, having two comparatively long, and two short, adjacent sides; and all its angles are somewhat rounded. It measures 2 inches long, 1·5 inch in greatest breadth, and ·4 inch in greatest thickness, that is at the bulb of percussion, and very near the angle formed by the two short sides. The convex face was produced by the dislodgement of a single flake, and has on it no indications of dressing or of use; whilst the concave face affords proof of a considerable amount of dressing, especially along the two long sides, each of which has been reduced to a thin knife-like edge, with a slight thickening at the rounded point. The short sides are thick and unwrought; and on one of them are traces of the original surface of the nodule. The implement resembles in form the specimen figured by the Rev. Canon Greenwell, M.A., F.S.A., in his *British Barrows* (1877), fig. 20, p. 39, and which he terms "a knife." The Canon's specimen, however, was larger, being 2·8 inches long and 1·8 inch in greatest breadth. Its angles also appear to be less rounded.

The specimen found in March, 1880, belonging, it is believed, also to the larger grave, is trilateral in outline, and has two of its sides almost rectilineal, whilst the third is curvilineal. The straight sides meet at a right angle, and are of unequal length, one of them being 1·6 inch and the other barely 1·1 inch. It attains its greatest breadth near the middle, where it measures 1·3 inch. The straight edges are square, and ·3 inch thick. The curved edge is variable in thickness, but is everywhere bevelled and dressed. One face has a well-pronounced "bulb of percussion" but is otherwise slightly concave, whilst the other face has a tendency to flatness. This tool undoubtedly belonged to the group known as "Scrapers," but amongst the numerous figures I have examined there is not one having the same outline.

The remaining two implements, found, as already stated, amongst the materials thrown out of the smaller grave, are not so large as the foregoing two. The larger of them is elliptical in outline, nearly flat on one face, whilst the other, whence seven flakes have been dislodged, is very convex. It is 1·2 inch long, barely ·9 inch in greatest breadth, and ·4 inch

in greatest thickness. The edges, almost everywhere sharp, are without marks of dressing or of wear and tear.

Its companion tool, or chip perhaps, is still smaller, being .9 inch long, .6 inch in greatest breadth, and .4 inch in greatest thickness, which it attains near one end. One of its faces is slightly concave, and rudely a trapezium in outline; the other is convex, and has several facets. Its edges are without marks of dressing or of use, but some of them are thin and sharp.

The bits of pottery, found also amongst the materials thrown out of the smaller grave, are very small and fragile, and the vessel they represent was made of coarse reddish-brown clay. The sides appear to have been not more than .1 inch thick, and the exterior was ornamented with lines crossing one another, at least, nearly at right angles, and at somewhat variable distances, but averaging probably about .1 inch. Judging from a portion of it amongst the fragments, the bottom of the vessel was circular, and 3 inches in diameter.

II. HUT CIRCLES IN THE PARISH OF CHAGFORD:—The Devonshire antiquary need not be informed that the district in which Mr. Slade found the graves described above, abounds in relics and objects of the highest interest. A leisurely stroll on a summer afternoon will take the visitor from Thornworthy to the "Longstone Pillar;" to Stone Circles, including the "Roundy-Poundy;" to Rock Basons; and to the "Hole Stone" in the bed of the North Teign—the only specimen in Devonshire having any pretensions—and those very slight—to be called a "Tolmen." I had the advantage of visiting them recently—or, at least, the greater number and most important of them—under the guidance of Mr. Slade, who has not only familiarized himself with all their details, but has discovered, and studied, and pointed out on the Mevill estate, also in the parish of Chagford, but on the south side of the South Teign, several circles of which no known record exists. He has been so good as to favour me with the following description of the Mevill circles just mentioned, and has permitted me to incorporate it in this communication:—

"Torquay, 19th April, 1880.

"Since we met at Mr. Standerwick's in September last, and together inspected the fine group of Hut Circles on Mevill, the estate adjoining Thornworthy, I have had opportunities of examining them more closely, and have now the pleasure of handing you the following particulars respecting them.

"I may, in the first place, say that they are the largest and

best preserved Hut Circles that I am acquainted with on Dartmoor; and are evidence that the district in which they occur has been the residence of some of the ancient inhabitants of the country. The situation and number of the dwellings, their proximity to the river, the traces there are of tin-streaming works a short distance off, and, lastly, the graves that are close by, all point to the existence at a remote period of an important settlement there.

"On Mevill I have found eight circles in all. There were formerly more; as I have been informed by an old lady now resident on an adjoining farm, whose youth was spent at Mevill, that her father, who farmed the estate, had destroyed several circles, when he met with them on the tillage part of the farm.

"The accompanying sketch, prepared by my friend Mr. P. Varwell, of Brixham, who kindly assisted me in taking the bearings and measurements, will give some idea of their situations and relative positions. The bearings are all magnetic.

"The Circle No. 1 is due south from Thornworthy Tor, and the kistvaen discovered in November, 1878, is nearly in a straight line between them. The South Teign runs about midway between the kistvaen and the circle and is 180 paces from each of them. This circle is 24 feet in diameter; the entrance has an E.S.E. direction; it is very perfect, all the stones being erect.

"The Circle No. 2, also 24 feet in diameter, is 5 paces N.E. from No. 1. The entrance has a S.S.E. direction from within. It is very perfect, and has the peculiarity of the wall being on one side laid in courses, four of which are visible; but it is not improbable that still lower courses may be concealed by the accumulated mould and soil. The stones are placed so as not to form a vertical wall, but each overlaps that on which it rests; that is, it projects inwards towards the centre of the circle, so that were the wall continued upward in the same manner the stones would meet at a height of, say, 20 feet, and form a sort of dome-shaped building. My idea is that from the height of, say, 4 feet, where the stones cease, these huts were carried up with Moor turf, thus forming a dome-shaped structure, having a hole at the top.

"The Circle No. 3 is 20 paces E.S.E. from No. 2. It is less perfect than the preceding circles, and the situation of the entrance is uncertain. It measures 34 feet in diameter. There are in this case indications of an inner circle of small stones. The outer wall also is double and its stones are placed horizontally, not vertically, as is the case with most of the others.

"The Circle No. 4 is 150 paces E.N.E. from No. 3, and 30 feet in diameter. The entrance, which is especially well defined, has a S.W. by W. direction. This is the finest of the eight circles, and, as a whole, is best preserved. The stones composing it are very large, and kept in their places by a double outer row of stones and by banking up the earth outside to the level of the top, so that when within it one feels to be in a sunken enclosed space.

"The Circle No. 5 is 100 paces E. by N. from No. 4, and is approached through a stone avenue about 75 paces long, but having most of its larger stones thrown down; those remaining erect are, with one exception only, short and rather small. The avenue begins at a short distance from the river, where it is about 8 feet wide; it gradually widens thence, until on reaching the circle it is 31 feet wide. One side of it runs into the circle, but it widens out on the other, overlaps the entrance, and joins the circle at a point beyond, thus forming a vestibule or enclosure outside the well-defined entrance. This remarkable structure appears to have been entirely overlooked by the Antiquary. I have met with no notice of it in any book treating of the antiquities of Dartmoor, nor have I heard of anyone having investigated it. It had remained unknown to me until one day in 1879, when working in snowy weather at the cairn in which the graves were found, I saw, clear of other objects, and standing out in the snow, on the hill side, the double row of stones forming the Avenue ending in the well-defined circle at the top. This circle is 27 feet in diameter, and its entrance has a W. by S. direction. The kistvaen cairn, about 400 paces distant, bears from it S.E. $\frac{1}{4}$ S., and the avenue is in the straight line from the one to the other.

"The Circle No. 6, 40 paces south of No. 5, is 25 feet in diameter. It consists of very massive stones, and two of them are so very large as to suggest that they could not have been placed there by human agency, but that advantage had been taken of their natural position, and the remaining stones so fixed as to form a circle. This circle is imperfect, and the entrance ill-defined.

"The Circle No. 7, 95 paces S. by W. from No. 6, is 28 feet in diameter, and is a fine circle. The walls have a double row of stones, and the interspaces are filled with soil and vegetable growth. The entrance is ill-defined.

"The Circle No. 8, 70 paces S. by W. from No. 7, is imperfect.

"All the circles described above are within the parish of Chagford.

"I may say in conclusion that the locality is well worth the attention of the Antiquary.

"(Signed)

SAMUEL H. SLADE."

From Mr. Slade's statements and Mr. Varwell's plan (corrected for magnetic variation), the eight circles may be said to be placed, with a few slight irregularities, along two sides of a scalene triangle, of which the angular points are the centres of the 1st, 5th, and 8th circles, respectively. From the 1st the distance of the 5th is about 294 paces (= 784 feet), in a N.E. direction; and from the 1st the distance of the 8th is about 270 paces (= 720 feet), in an E. direction; whilst from the 8th the distance of the 5th is about 220 paces (= 587 feet), in a N. by W. direction. The triangle may be thus said to have a north-westerly, an easterly, and a southerly side. Between the circles at the two angular points there are three circles on the north-westerly side of the triangle, two on the easterly side, but none on the southerly side.

From the cairn in which Mr. Slade found the two graves the 1st circle is 360 paces (= 960 feet) towards E.S.E., the 5th circle is 420 paces (= 1,120 feet) towards E. by S. $\frac{1}{2}$ S., and the 8th circle is 585 paces (= 1,560 feet) towards S.E. $\frac{1}{2}$ E.

The following Table (corrected for variation) will show at one glance the principal facts connected with the circles :

Circle.	Diameter in feet.	Aspect of Entrance from within.	Condition.	Remarks.
1st.	24	E.	Very perfect	Stones erect.
2nd.	24	S. E.	Very perfect	Wall in courses of stones which indicate a dome shape.
3rd.	34	Uncertain	Perfect	Stones laid horizontally. Has an inner circle of small stones.
4th.	30	S.W. by S.	Very perfect	Stones very large. Supported externally with stones and earth.
5th.	27	S.W. by W.	Very perfect	Has an avenue 200 feet long pointing to the grave-cairn.
6th.	25	Ill-defined	Imperfect	Massive stones.
7th.	28	Ill-defined	Perfect	Wall double.
8th.	27	Ill-defined	Imperfect	

III. SILVER COINS OF ELIZABETH, JAMES I., AND CHARLES I., IN THE PARISH OF MANATON:—In a letter, dated 11th June, 1879, Mr. P. F. S. Amery, of Druid, Ashburton, informed me that "on 28th May, 1879, workmen engaged in taking off the roof of an old farmhouse at Easdon, Manaton, Devon, the property of Mr. Kitson, of Torquay, discovered a small leathern bag, between the ceiling and thatch, in which were fourteen silver coins in a piece of canvas."

Mr. Amery stated that he had "seen eleven of the coins," and that "they were all shillings, viz., 2 of Elizabeth, 3 of James I., and 6 of Charles I." He added that "some twenty years ago some coins were found in the same building."

Mr. Kitson, on whom I called at once, kindly lent me the fourteen coins, and consented to my writing and printing any memoranda I might think desirable about them. He stated at the same time that the purse with its contents was lying on one of the ceiling joists.

As already stated the coins are fourteen in number, all of silver. They are four of Elizabeth, three of James I., and seven of Charles I.

The three coins of Elizabeth are shillings, all specimens of one and the same coinage, and answering in every respect to Fig. 7, Pl. vii., in *The Coinage of the British Empire*, by Henry Noel Humphreys, 1854, which, that author states, "is one of the . . . hammered shillings, having the profile young-looking, and crowned, with 'ELIZAB. D. G. ANG. FR. ET. HIB. REGI,' and on the reverse the arms traversed by the cross, with the old motto, 'POSVI DEV. ADIVTOREM. MEV.' [= I have made God my helper.]

The three coins of James I. are also shillings, but belong to two distinct coinages.

Two of the coins appear to belong to the first coinage of James after reaching the English throne. (See *Coin. Brit. Emp.*, p. 98.) On the obverse is the king's bust in profile, crowned, in armour, and having "xii" behind the head to denote the value. The titles read "IACOBVS. D. G. ANG. SCO. FRA. ET. HIB. REX." On the reverse are the arms of Scotland and Ireland, quartered with those of England and France, which, according to Humphreys, "was now done for the first time." (*Coin. Brit. Emp.*, p. 98.)

The motto is "EXYRGAT. DEVS. DISSIPENTVR. INIMICI." [= Let God arise, let His enemies be scattered.]

The third shilling of James I. belongs to the second, or a still later, coinage of that monarch. It differs from the pre-

ceding two in having on the obverse "MAG. BRI'" instead of "ANG. SCO.," "FRAN.'" instead of "FRA.," and in a slight difference in the ornamentation of the crown.

On the reverse the motto is "QVÆ DEVS. CONIVNXIT. NEMO. SEPARARE" [= Whom God has united, no one shall separate], "allusive," says Humphreys, "to the union of the crowns."

This coin differs from that figured by Humphreys (Pl. ix. Fig. 2) in having nothing above the shield; whereas the figured specimen has the Welsh feathers extending from the top of the shield to the edge of the coin. In all other respects the two appear to be identical.

Of the seven coins of Charles I., one is a half-crown and six are shillings.

The shillings have each, on the obverse, the king's bust, in profile, crowned, with "xii." behind the head to denote the value, and the titles are essentially the same on all, though with differences in the abbreviations employed. On the reverse, they all have the arms of England, France, Ireland, and Scotland quartered in a shield, and precisely the same motto occurs on each: "CHRISTO. AVSPICE. REGNO." [= I reign under the auspices of Christ], which was adopted in the king's first silver coinage. (See *Coin. Brit. Emp.*)

Nevertheless, the six coins appear to belong to as many distinct coinages, for they differ in the abbreviations employed in the titles, in the form as well as the ornamentation of the shields, and in the mint marks. Arranging them, as a matter of convenience only—and without supposing the order to be chronological—as 1st, 2nd, and so on, the titles and mint-marks are as follow, the letters in brackets denoting that they have been effaced:

1st. "CAROLVS D'. G'. MA'. BR'. FR'. ET. HI. REX." A small crown.

2nd. "CAROLVS D'. G'. M[A. BR'.] FR'. ET. HI. REX." A tun.

3rd. "CAROLVS. D'. G'. MAG'. BRI'. FR'. ET. HIB'. REX." A portcullis.

4th. "CAROLVS. D'. G'. MAG'. BRI'. FRA'. ET. HI'. REX." [Indeterminable.]

5th. "CAROLVS. D'. G'. MAG'. BRIT'. FRA'. ET. HI'. REX." A triangle in a circle.

6th. "CAROLVS. D'. G'. MA'. BR'. FR'. ET. HI'. REX." An anchor.

Proceeding to the shields, and observing the same order:

1st. Circular, border highly ornamented.

2nd. Identical with the first.

3rd. Oblong, with all the angles rounded off. Border orna-

mented. The letters "c" and "R" outside it, and on the left and right respectively.

4th. Almost square, with the lower angles rounded off. Border almost quite plain.

5th. Much like the fourth.

6th. Much like the fourth; but traversed by a cross extending beyond the border.

The mint marks occur also on the reverses, and correspond with those on the obverses respectively.

All the shillings belong, no doubt, to the period before the civil war.

The half-crown has seen rough usage, and appears to have been clipped in two or three places. On the obverse is a figure of the king on horseback, with sword nearly erect, and having behind him one example of the Welsh feathers. The titles are probably "[CARO] LVS. [D:G:MAG:BR:] FR:ET:HIB:R[EX:]," but the letters I have placed within brackets are effaced or cut off. Humphreys figures three coins having Charles on horseback (Pl. lx. Figs. 12, 16, and 17), but neither of them agrees with the figure on the Manaton half-crown. In figs. 12 and 17 the sword inclines backward, and in fig. 16, though it inclines forward, it is not quite so much inclined as in the coin under notice. Moreover, the left leg of the rider does not in any of the figures exactly correspond with that on the coin, where it is placed in the same line with the foreleg of the horse, even more decidedly than in figure 17; the foot of the rider reaches a lower level than in any of the figures. Indeed, the foot on the coin reaches an incorrectly low level. Again, in figure 16, the city, with the word "OXON" above it, is seen under the horse; and in figure 17 the horse is trampling upon arms and trophies; but on the coin there is nothing beneath the horse, and in this respect it resembles figure 12.

On the reverse of the half-crown there is around the margin the motto "EXVRGAT: DEVS: DISSIPENTVR: INIMICI"—already mentioned as occurring on two of the Manaton shillings of James I. Across the centre of the coin there is, in two parallel lines, the motto "RELIG: PROT: LEG: ANG: LIBER: PAR" [= Religiosus Protector Leges Angliae Libertatis Parliamenti = The religious protector of the laws of England and the liberty of Parliament], alluding to the king's "declaration at the breaking out of the war," says Humphreys, "that he would protect *the protestant religion, the laws and liberties of his subjects, and the privileges of parliament.*" Above this

motto are three examples of the Welsh feathers placed in a curve concentric with the edge of the coin, and below the motto the date "1643"—the only instance of a date on any of the Manaton coins.

The following passages from *The Coinage of the British Empire* may be calculated to throw some light on questions connected with this coin :—

"Silver was exceedingly scarce during a part of the reign of [James I.] . . . A good deal of silver was refined from the lead mines of Wales,—the coins made from this silver always bearing the Welsh feathers, to denote the origin of the metal.

"There was also established a permanent mint in his [Charles] thirteenth year [1637–8] at Aberystwith, for refining and coining the silver produced from the Welsh lead mines. The coins of this mint may be known by the Welsh feathers." p. 102.

"After the defeat of Edgehill [1642], the king removed the mint of Aberystwith to Oxford, to coin there, in New Inn Hall, . . . all the remaining plate of the colleges; . . . and as it was still considered the Welsh mint, although removed, the Welsh mark of the feathers was continued." p. 103.

From the foregoing statements it may be concluded that the Manaton half-crown was coined at Oxford, the date and the feathers being evidence in favour of the proposition, though Mr. Humphreys neither mentions nor figures any coin of 1643; and it seems not improbable that the college plate supplied the silver it contains.

The "small bag," or purse, was formed of two pieces of leather of different kinds, sizes, and forms. The larger piece was of sheep skin dressed in the manner known as *Basil*. Its form was a segment of a circle of 5 inches radius. The chord of the segment was 6·25 inches and the versed sine 3·25 inches. The smaller piece was also of sheep skin, but dressed in the *white* state. Its form may be described as a vertical section of an irregular pyriform body, 4·5 inches in length, and 3 inches in greatest breadth. The two pieces were stitched together, the vertex of the smaller piece and the rectilineal margin of the larger being alone free, and having a leathern cord passing through a series of holes in them, thus enabling the mouth of the purse to be drawn together and closed.

The stitching has given way; but the very well preserved state of the leather is not suggestive of an antiquity dating from the times of Charles I.

IV. A "JACK-KNIFE" IN THE PARISH OF MANATON:—In the same cottage, and at the same time, there was found, also between the ceiling and the roof, but many feet from the purse mentioned above, a clasp knife, known in the trade as a "Jack-knife," but which was apparently an extinct variety of the species. The "bolster" was .75 inch long; the handle, of buffalo horn, had a very strong back spring. The blade, 4.5 inches long, had the form of a razor rather than that of a knife of the present day. It was .6 inch broad at the "bolster," and increased gradually to fully an inch at the other end; the cutting edge was convex whilst the back was concave. The blade bore a trade mark consisting of a figure of four surmounted with a six-rayed star—†.

Learning that I was to visit Sheffield in August, 1879, Mr. Kitson allowed me to take the knife with me, in the hope of finding some one there who, aided by the trade-mark, might be able to give some information respecting its probable date.

Soon after I reached Sheffield, Mr. A. Ernest Sorby, of Park Grange, was so good as to undertake the investigation; and before I left he handed me the following statement:

"Bradshaw made this kind of knife in the neighbourhood of Lambert Street, Sheffield, about 150 years ago. He removed to Hollis Croft, Sheffield—the place where he last manufactured them—in 1750. Whithers made this kind of knife, in Sheffield, as recently as 1800. At the present time knives are used in the West of England known as the 'Whithers' pattern.' No such cutlery manufacturer is now in Sheffield. The mark (†) was granted by the Corporation of Cutlers, Sheffield, to George Broadbent, in 1709. It is probable that he disposed of his business to either Bradshaw or Whithers. [Signed] A. E. S., 27th August, 1879."

From the foregoing statements it is obvious that the knife was not made before 1709, but may have been made at almost any subsequent date.

Since receiving Mr. Sorby's memorandum, Mr. Colley, of the firm of Wade Wingfield & Rowbotham, Sheffield, was so good as to present me with a specimen of one of their "Jack-knives" of the present day, apparently a lineal but modified descendant of the Manaton knife, and intended evidently for the use of a "Jack tar." I learn from the Torquay ironmongers that they do not keep this knife in stock, there being no demand for it in that district.

AGRICULTURE IN NORTH-EAST DEVON, FIFTY TO SIXTY YEARS AGO.

BY W. H. GAMLEN.

(Read at Totnes, July, 1880.)

ALMOST every part of farm management has so much altered during the last half century, that the writer thinks it may be interesting if he records some recollections of what he saw and knew done about that time ago.

Farms and fields were usually not so large then as now, and more of the work was done by the farmers, indoor servants, and apprentices; every householder being obliged to take from one to six of these latter in proportion to his rental. These boys or girls were the children of persons receiving parish relief, or likely to require it, and were bound, at the age of seven or eight, to live with their master till they were twenty-one; he having to provide them with food and clothes, and medicine if required, and they worked without wages in return. It frequently happened, when they were sixteen or eighteen years old, and had learnt ploughing, hedging, reaping, mowing, and threshing, which their masters were bound to teach them, that they ran away, to try to get work for wages; and advertisements were often seen in the newspapers, describing the fugitives, and warning persons not to employ them. In other cases they misbehaved, and got sent to prison for short terms, and so annoyed the master, that he applied to the magistrates to cancel the indenture; after which they could do as they pleased. Where the master could work with them, and keep them till of age, they usually made good workmen, and often married and continued to work for him for many years. It has been often observed, that these workmen were far superior to their successors, who did not learn their work so thoroughly, nor take so much interest in it. The boy's dress was usually a

fustian jacket and waistcoat, leather breeches and shoes; boots were never worn; pieces of bag were tied round the ankles as a sort of gaiter, and called "kitty-bats," to keep the earth out of the shoes. These shoes, made of hide leather, were washed every Saturday night, and well greased after being dried, and in time became almost as stiff and hard as wood.

The village tailor used to go to the farmhouse, and make and mend the boys' clothes with materials kept for the purpose, and received eightpence and sometimes a shilling a day and his food for doing this. He sat on the kitchen table at his work, and kept the mistress employed in supplying his requirements of more cloth, thread, buttons, &c., till her patience was well worn. On one occasion, in hot weather, an apprentice girl whispered, "Missus, missus, the tailor is asleep!" and received for answer, "Hush! for patience' sake don't wake him; I've had plague enough with him already." In some places the shoemaker went to the house, and mended what required repair from a stock of leather kept for him.

The apprentice girl milked, and tended the pigs and calves; if these were many, the boys helped her. She also helped to make butter, scald the milk, and make cheese, which was consumed in the house, or sold for threepence or fourpence a pound, being so poor in quality that now it could scarcely be sold at all. The boys helped to feed and bed the horses and bullocks night and morning, and while young, drove plough, and assisted in any other work they were fit for. They and the servant man had broth or milk with bread for breakfast a little before seven a.m., and took some bread and cheese in a bag, to eat with their cider for "forenoons," about 10.30. The whole family dined in the kitchen together at one o'clock, the man and boys, at the lower end of the long table, using pewter plates or wooden trenchers; the master and his family at the other end using plain white earthenware. Cider or home-brewed ale was the usual drink of all.

In some places the apprentices were worked very hard, roughly treated, and beaten for trifling faults or awkwardness in doing their work. Teaching them to read and write was rarely thought of. A late well-known member of this Association, whose parents were very poor, worked for a farmer when a boy, but showed such mental abilities that some gentlemen sent him to school, and thence to Cambridge, where he took a high position in mathematics. An old farm labourer being told of this, said, "Well, I don't know about that; but he was one of the stupidest boys that ever drove

plough for me. I've droed scores of clats of æ'th at the head of en."

Ploughing was usually done by three horses, walking singly in the furrow, and driven by a boy, a wooden "sull" being used, the share and coulter of which were of wrought iron, and required frequent repairs; the coulter was set by several wooden wedges, and took considerable skill to adjust it properly. "Ploughs" of four, six, or eight oxen were also used, and materially helped in tilling the land; working by yokes and wooden bows, a chain passing between each pair, fastened to the middle of the yoke by which they drew. Horses were principally used for hauling earth, manure, lime, &c.; oxen also drew hay and corn at harvest on "slides," or wooden-barred sledges in hilly fields; in other places horses did this. In some parishes pack-horses were still in use, each carrying a "seam," or three hundred weight of load, or thereabout. Each had a wooden pack-saddle, reaching from the shoulders to the hips, and padded to prevent galling, on which corn and hay were carried in long crooks hung across it by stout cords; these crooks were round at the bottom, and made of small elm poles, and reached from near the horse's belly to about a yard above his back, and the load was laid lengthways in them, and over the horse's back; so that when laden little more than his head and tail were visible. Bags of corn, lime, and potatoes, faggots of wood, &c., were carried on short crooks, which projected at right angles from the horse's sides. On both sorts of crooks the load was fastened down by a leathern circingle (commonly called a sissing-girt), which went round it, and buckled under the horse's belly. Panniers for carrying small articles were fastened in the same manner. Earth, manure, stones, &c., were carried in "pots," made of ashen hoops; these widened from the top to the bottom, which was a flap of board hinged at the back, and fastened by a pin thrust through a staple, on removing which the load fell out on the ground. The horses were light-grown and active, walking fast when loaded, and trotting or cantering back, with their driver on the saddle, when going "leary" for another load.

Common white or red turnips were cultivated; swedes were seldom seen; mangolds quite unknown; consequently not half as many sheep were kept as at present. Summer fallows for wheat were usual, the land being ploughed, manured with lime, cross-ploughed, and worked down fine before sowing in October. All corn was sown by hand; three bushels of wheat, four of barley, and five to six of oats

per acre broadcast. Haymaking was a lively scene. The mowing was by hand, about an acre a day being cut by each man. Four quarts of cider were allowed him, and sometimes more; and food was supplied by some persons. The hay was all hand-made by women and boys, the men helping too after ending the mowing; and the smith, carpenter, and other tradesmen of the parish often assisting to house the crop. Reaping was also done by hand with a reap-hook, about an acre a day being cut by each man. Neighbours helped each other, two or three sending their men to help one, and getting similar help in return from each. In this way fields were quickly cleared one after another.

Reaping was a sort of festival, food being provided for all: breakfast in the house; "forenoons," dinner and "drinkings" in the field. Hot bread and butter, and currant cakes with "toast and cider," cheese, and sometimes cold meat, being provided for the latter, when a small nosegay called a "reaping tetty" was given to each reaper. If there was a large party, "a neck" was usually cried when the field was finished.*

The foreman, hindman, middleman, and "catch-pole" (the third man behind the foreman), were expected to keep order, and see the work fairly done by each reaper without shirking. The "catch-pole" was often a wag, and had some flowers and a ribbon round his hat, and claimed some humorous privileges.

Threshing was always done by the hand-flail, except on a few large farms, and provided pleasant though rather hard work in winter, and rough weather. Early training and long practice were required to do this well, and especially to make reed for thatching from the sheaves of wheat. Winnowing, too, was all done by hand; in some cases with help of a machine; but generally with a fan, made of wooden bars, with bagging nailed to them, hung by two pivots on a wooden frame, and turned by a handle. If there was a strong wind blowing, this alone was used, the corn being shaken

* In this singular custom the foreman called on the reapers to stand round him in a ring whilst he cut the last handful of standing wheat; the catch-pole then called out "a neck! a neck!" and began the shout of "We ha'en" (we have him), all joining in it three times, as loudly as they could, bowing to the ground each time slowly with their hats in their hands. After a slight pause the cry and bowing were repeated twice, and after another pause were repeated once; then came a loud laugh, followed by "Hip, hip, hurrah!" After this all drank to the good health of master, missus, and all the family, wishing them a good harvest. Then followed more hurrahs. The handful of corn was, in many places, tied into an ornamental bundle, and hung up in the farm kitchen till the next year's reaping. This was the neck.

out in front of it from a "simmet," or close sieve, on to the floor of the barn, or sometimes on a winnowing-sheet in a field. Doing this well, and getting the corn fit for the miller, required much skill, and was usually done by the master, with a man and boy to help him. "Riving" with a fine sieve, to sift out dirt and seeds of weeds, and get light corn, &c., to a focus on the top by a peculiar spiral motion, was an art possessed by few.

Lime was largely used for manure, and as most of it was drawn for wheat by everyone about the same time, and in some places from a long distance, there was much contention at the kilns by the carters in getting loaded quickly. As the lime-burners loaded each in the order of his arrival, some farmers sent on a boy on their fore-horse ahead of their cart or waggon to "keep stem" for it, or secure its place at the kiln, which was treated as equivalent to the waggon itself being there; so that it would be loaded on its arrival, although others might have been at the kiln before it, but after the boy on the horse, who passed them on their way. Sometimes the lime was so hot that, unless it was spread at the kiln's mouth to cool, it would burn the waggon, and this caused much delay in loading. Guano, superphosphate of lime, bone dust, and other artificial manures, were unknown at that time; lime and farm-yard manure were alone used, the lime being mixed with earth drawn from the "foreheads" or headlands of the fields by a "three-wheeled butt"—a sort of large barrow on three low wheels of solid wood.

Seven shillings a week were the usual wages for men, with three pints of cider a day. In harvest food was given, or extra pay, in consideration of the longer hours of work; and generally grist corn was supplied at less than the market price of wheat, but often of very inferior quality. Sometimes the run of a pig in grass was added, or some potato ground at a low charge. Making hedge (casting earth on the top of the bank, laying and crooking down horizontally some of the wood growing on it, and cutting off and making faggots of the rest), driving out earth with a barrow, spreading manure, cutting grass and corn, threshing, and making up reed for thatching, were often set as task-work, enabling the labourer to earn double the usual wages by working longer hours. Women were paid eightpence a day, with one quart of cider, for weeding corn, hay-making, binding corn, digging turnips, picking stones and apples, &c.; boys sixpence a day, if not apprenticed.

Hedgewood was cut at five years' growth, the ash poles

being used for making hurdles, the halse (hazel) for spars for thatching. Wood was the only fuel used, coal being very scarce and dear, and hearth fires were therefore universal. Thorns and brambles were made into "browse" faggots for baking, and making a blazing fire for drying clothes and other purposes. Sometimes the brambles were made into very small faggots called "nickeys," which were used for heating the furnace, the fireplace of which was large enough to take them in whole, and so save the trouble of dividing the tangled browse faggots. Furze sold at a good price, being the principal fuel used by bakers for heating their ovens.

Almost all farmers rode to fairs and markets on horseback, the roads not being good enough for gigs, on which there was also a heavy tax. Purchases from the towns were brought home in panniers, or in a cart, which probably had been sent with corn for sale by retail in the market—selling corn by sample not being usual, as it now is. Live stock was mostly sold at fairs, to which dealers came from long distances, or at great markets, also held periodically. Payments were invariably made in cash or bank-notes. Very few persons had a banking account; consequently large sums were kept in the house for wages, and making other payments. One pound local bank-notes were much more in use than gold.

Each parish relieved its own poor, the amount to be paid to each pauper being settled by the farmers in vestry, commonly on Sunday, after the afternoon service; notice being read out in church by the clerk, for meeting at that time.

The payment of tithes was most vexatiously managed; either the clergyman receiving less than his due, if easy-tempered and inexperienced; or the farmers having to pay much more than was right to grasping tithe-owners, under threat of otherwise having them "taken in kind." This system required the farmer to give due notice of his intention to cut hay or corn on a fixed day, and to cut it on that day, be the weather what it might, or to give fresh notice for another day, and cut it then. A proctor, sent by the tithe-owner, attended, and marked each tenth "pook" of hay, or stitch of corn, by placing a twig of wood on it, and these had to be left where they stood, when the rest was ricked; notice of doing which had also to be given, and adhered to. Any default in giving notice, or interfering with the proctor, or irregularity, rendered the persons liable to process in the Ecclesiastical Courts, which were most dilatory and expensive. Every tenth pig, lamb, or fowl, egg, cabbage, or other

vegetable, and fruit, had to be set apart in the same manner, with notice given, and the milk of every tenth day was fetched. It is scarcely possible for those who have not experienced it to conceive the worry and trouble all this caused to both parties, nor the ill-will created between the clergy and their parishioners; their influence for the promotion of religion among the people was almost destroyed by it. Happily in another generation all this will be forgotten.

THE OLD INNS AND TAVERNS OF EXETER.*

BY ROBERT DYMOND, F.S.A.

(Read at Totnes, July, 1880.)

“Whoe’er has travelled Life’s dull round,
Where’er his stages may have been,
May sigh to think he still has found
The greatest comfort in an inn.”

SHENSTONE.

IN one of his oracular and sententious utterances, Dr. Johnson declared that “there is nothing that has yet been contrived by man by which so much happiness is produced as by a good tavern or inn.” But, inasmuch as Boswell tells us that this opinion was pronounced just after the great doctor had “dined at an excellent inn,” we may fairly receive the sentiment as the pair received their meal,—with a grain of salt. It would be foreign to the purpose of this paper to enlarge upon the benefits or to denounce the evils connected with inns and taverns. It is enough to know that they exercised on the domestic lives and habits of our forefathers an influence sufficiently potent to establish their claim to share the attention of historical writers with churches, and monasteries, and castles. That the inns and taverns of Exeter should have been both numerous and important may be readily accounted for if we consider some of the leading characteristics which distinguished the city in past times. Its geographical position made Exeter the centre and key of western travelling. As a cathedral city from the reign of the Confessor, it contained a large and mobile ecclesiastical population. The county nobility and gentry resorted to it for private and public affairs, and many of them spent a portion of each year in their

* This paper originated in a lecture delivered at Exeter in April last, and reported very fully, though not entirely, in the Exeter newspapers. A considerable portion is new matter. Much of the material of the lecture has been omitted, and the whole so completely remodelled as to be in no sense a reproduction of the lecture, nor an infringement either of the letter or the spirit of that salutary rule of the Association excluding papers which have already been published *in extenso*.

town mansions within its walls until increasing facilities of travel enabled them to pass the season in London. Exeter has also been the great mart of a woollen manufacture which, directly or indirectly, provided the means of subsistence to the major part of its inhabitants, and drew together traffickers from an extensive district. It naturally followed that Exeter was thickly studded with taverns, and contained also a goodly number of old English inns or guest-houses. The taverns supplied the drinking needs of a population addicted to a full average extent to the besetting sin of the Anglo-Saxon race. The inns provided temporary shelter for a crowd of wayfarers, and for the carriers whose pack-horses brought to Exeter from all parts of the county the crude work of village looms and water-mills to be perfected and exported. Many of these inns or taverns existed in the city even in times when the monasteries provided for the entertainment of strangers, and when the practice of private hospitality was not only enjoined by custom, but enforced by law. The inn was a lodging-place for travellers, as its name implies; whilst the tavern or wine-shop was a place where much business was transacted in an easy, convivial sort of way, over a friendly cup. Before newspapers existed, the inn was the great focus of intelligence from far and near, whilst the tavern was the nursery of local news and gossip. There has always existed in England a numerous class who, like Chaucer's apprentice,

"Loved better the tavern than the shoppe."

For such as these the taverner's ready wit and jovial manners made his house attractive, whilst his bold round voice and confident manner established his position as an oracle amongst his customers. The name of landlord has somehow come to be misapplied to an innkeeper, but it is plainly of modern intrusion, and has a less genial sound than "mine host." The terms vintner and taverner were often used as if they were synonymous; but, strictly speaking, the taverner was the person who dispensed by retail the liquors imported by the vintner. These merchants have held for centuries an important position in Exeter. In a grant by Sir John Fulford, Knight, to John Tuckfield and Joan his wife, dated the 5th of March, in the first year of Queen Mary (1553-4),* the name of Vyntener's Street is applied to a thoroughfare in St. Mary Major's, leading from the higher part of South Street towards Preston Street, a locality where inns and taverns especially abounded.

* *Guildhall Archives*, No. 1484.

Notices of the inns existing in Exeter before the dissolution of monasteries are few and scanty. The earliest of which I have met with distinct mention occurs in an Inquisition, taken on the death of Roger atte Wille [Attwill in later times], citizen of Exeter, in 1381, *when he was found to have owned a messuage called Sutton's Inn, in High Street. (Sottonysyn in alto vico.) It reappears in 1390, when Richard II. granted to William Corby, Esq., the same premises under the name of "Sutton's Ynne."†

Next in order of date we find a tenement called "Londesyn," held in Exeter by Hugh Courtenay, Earl of Devon, at his death in 1423.‡ More detailed particulars are obtainable of a tavern called Beaufitz or Beavis's Tavern, adjoining the outer face of Broadgate. Between the years 1447-50, John Shillingford, one of the ablest mayors of Exeter, makes the proceedings at this tavern one of the grounds of complaint against the cathedral authorities.§ He asserts that the slumbers of peaceable and law-abiding citizens were disturbed by the "ungodly carriage" of suspicious men and women, "divers night-walkers and riators," priests and others, who issued from the Close at all times of the night through a wicket of the Broadgate, and entering the said tavern, made much "noyse, affrays, and debates." The city receiver's accounts, quoted in the Appendix to Shillingford's *Letters*, show the existence of a "Bell Taverne," probably on Bell Hill, South Street, in 1447-9. In 1452, during the mayoralty of William Pope, the Dean and Chapter granted to William Gochyll a ruinous messuage called "Bryghtelegh ys Inne," with a garden, in the parish of All Saints [Allhallows] on the Walls, next the way leading to Bryton [the lower part of Bartholomew Street], and extending to the tenement of Thomas Courtenay, Earl of Devon.|| It is worthy of note that the inns of this period were generally distinguished by the name of the host. Probably the use of signs or emblems was not then in full vogue. Another ancient inn was *The Bull*, in Magdalen Street, bequeathed by John Palmer, in 1487,¶ for the support of his almshouses, which stood in that street until 1866, when they were rebuilt at the corner of the Barnfield or Denmark

* *Cal. Inq.* p.m. 4 Rich. II., Rogerus atte Wille.

† *Cal. Pat. Rot.*, p. 219, 13 Rich. II.

‡ *Cal. Inq.* p.m. Hugo Courtenay, Comes Devon, No. 29 b. 10 H. v.

§ *Letters of John Shillingford*, Camden Soc. Pub. pp. 90, 104, 113.

|| MR. STUART MOORE'S *Calendar of Chapter Archives*.

¶ *Commissioners' Report on Exeter Charities*, 1825, p. 113. JENKINS' *History of Exeter*, p. 380.

Road. This inn is also referred to in a lease of 1530, by which the mayor and corporation granted to Thomas White and Alice, his wife, a meadow, now a fruit garden, between Magdalen and Holloway Streets.* This land still retains its ancient name of Bull Meadow, and at the date of the lease was described as in "the east and south parts of a hospice called le Bull." In Goldsmith Street is another Bull Inn, to which Otho Channon removed, in 1715, from the King's Arms in St. Sidwell Street.† "Le Egle" inn, opposite the Guildhall, is alluded to in several of the corporation leases between 1481 and 1527.‡ It is also mentioned in Dr. Oliver's last edition of his *History of Exeter*, p. 205, as known by the name of the *Eagle House* in the middle of the fifteenth century; but he also refers to it as an inn in a manuscript note in my possession, and it is so described in the civic archives. The earliest reference to it occurs in a grant, in 1437, by Robert Wilford to John Coplestone, John Hody, John Fortescue, and John Mulys, of his dwelling-house in the High Street, called The Eagle, &c., opposite the Guildhall. These grantees probably held it for the Corporation, for we find from John Hoker's MS. extracts from the Chamber Act Books, that in 1472, during the mayoralty of Hugh Germyn, "the howse called the Egle over agaynste the Guyldhalle shalbe employed and put to the use of a Clothe Hall and that all foreyn drapers and clothiers resorting to the citie wth their clothes shall sell the same in that howse onlye and not els where wth in the citie."

In Exeter, as elsewhere, the ingenuity of innkeepers must often have been severely taxed in the selection of a sign, for when every shop was distinguished by some hanging emblem, it was necessary for the innkeeper to arrest attention to his house by something specially striking or eccentric. These signs commonly referred to some of the surrounding circumstances or to the class of customers expected. Thus the vergers and sextons, not to mention church functionaries of a higher grade, frequented *The Mitre*, in South Street, where Mr. Northam now carries on his trade. William Langham, who kept this inn, removed, in 1721, to *The Grape*, at the head of the Serge Market, in Southgate Street, but it ceased to be an inn when the *Exeter Flying Post* was first printed there 117 years ago. The dwellers about the Close had also

* *Calendar of Guildhall Archives.*

† Advertisement in *The Protestant Mercury*; or, *The Exeter Post Boy* newspaper, 10th January, 1715.

‡ These leases are referred to in Mr. Stuart Moore's *Calendar of the Exeter Archives at the Guildhall*, Nos. 1286, 1818, and 1401.

the *Peter Bell*, at Palace Gate, besides the *Cross Keys*, and many others within the sacred enclosure of the Cathedral Yard. Brewers might be looked for at the *Three Tuns*, or at the *Maltscoop*, now re-named the *Asminster Inn*, at the bottom of Paris Street. A quaint rhyme, written by Haywood, in 1608,* to describe this tendency of different trades and classes, may be parodied for Exeter after this fashion—

"The farmer to the *Oatsheaf*,
 The sailor to the *Ship*,
 The student to the *Oxford Inn*,
 Hastens with spur and whip.
 The churchman to the *Cross Keys*
 Or the *Mitre* hurries on,
 Whilst the citizen his friends may meet
 At the tavern of *King John*.
 My lady goes to the *Angel*,
 My lord to the *Rose and Crown*,
 Whilst the merchant finds the *New Inn*
 The oldest in the town.
 The butcher hies him to the *Bull*,
 The tailor to the *Fleece*,
 Woolcombers to the *Bishop Blaze*,
 To the *Lamb*, the man of Peace.
 You may hear the tipsy shoemaker
 Sing, as he rambles past,
 I sought good liquor all the day,
 And found it at—*The Last*."

But besides the signs indicating trades and callings, there were in Exeter a fair number of heraldic signs—signs borrowed from the crest or scutcheon of some lord or knight whose retainers, settling down to business in a tavern, desired thus to compliment their late masters or to secure family favour and influence.

The *Swan* of the Carys was the sign of a noted tavern in High Street, cleared away about the year 1834 for the site of Queen Street. It contained a large room for travelling exhibitions and public meetings, and its porch was supported by grotesque figures carved in oak. Another *Swan Inn* of ancient date may yet be met with in a more obscure position in Catherine Street. The *Dolphin* of the Courtenays, or of the Guild of Merchant Venturers, may still be found in Preston Street. The *Green Dragon* stood at the corner of Bedford Lane, opposite the present *Half Moon*, but the house which represented it of late years was taken down in 1878, when the lane was widened to form Bedford Street. The *Green Dragon* is marked in the map of Exeter published by Rocque in 1734, and John Vicars, its landlord, removed, in 1765, to

* Haywood's lines will be found in TIMBS' *Clubs and Club Life*, p. 367.

the *Turk's Head*, next the Guildhall.* The *Three Tuns*, another ancient inn still standing in High Street a few doors above the *Green Dragon*, probably took its sign from the arms of the Brewers' Company first incorporated in Exeter in 1579. Andrew Brice, in his *Mobiad* (p. 136), refers to another *Three Tuns* adjoining the east side of the Guildhall. Of the many beasts, birds, and fishes bearing colours to be found only in the menageries of the Herald's College, lions were perhaps the most numerous. They appeared in many hues and postures. There was a noted *Red Lion* in a court off Magdalen Street, and Exeter still boasts the possession of lions, *Red, White, Black, and Golden*.

The *Golden Lion* was no doubt adopted from the Royal Arms of England. The sign of the *Fleurs-de-Lys* was derived from another quartering of the royal shield. The locality of this house (for it may not have been an inn) can no longer be determined, and we must rely for evidence of its existence on the authority of an ancient poem, entitled *Edyth the lying widow*, where it is alluded to in these lines—

"In the cyte of Exeter by West away,
The time not passed hence many a day,
There dwelled a yoman discret and wise,
At the signe of the *Flower de Lyse*,
Which had to name John Hawkyn." †

The *Rose and Crown*, the emblems of the royal house of Tudor, stood in High Street, opposite St. John's Hospital, but was pulled down in 1834. The *White Hart*, a favourite badge of Richard II., had two representatives in Exeter, owing possibly to the fact that it was also a cognizance of our great Devonshire worthy, Sir Walter Raleigh. One of these *White Harts* was in Longbrook Street; and Andrew Brice, who was a keen observer of the eccentricities of his neighbours, tells us that its landlord, a Welshman, named Jenkin Williams, half lived on tobacco, and had generally finished his tenth pipe by ten o'clock in the morning. ‡ But the more noted of the two *White Harts* was the one in South Street, showing even now some vestiges of its condition when it was the great rendezvous of carriers, with their files of pack-horses, and when its yard was surrounded by those open timber galleries common to most of the old inns. We may remember that such a galleried yard existed in the *White Hart*, in the

* See his advertisement of 26th April, 1765, in Andrew's and Trewman's *Exeter Mercury*; or, *West Country Advertiser*, the original name of the *Exeter Flying Post*.

† See *History of Signboards*. Hotten, p. 128.

‡ BRICE'S *Mobiad*, p. 73.

borough of Southwark, where the immortal Mr. Pickwick first met with his faithful Sam Weller. A curious little anecdote, connected with the Exeter *White Hart*, in South Street, is told by Izacke in his *Memorials*.* It happened that in the year of King Charles I.'s execution, a carpenter had occasion to descend an old well in the inn yard. On reaching the bottom the man suddenly fell dead, and the same fate befel a companion who was sent after him. A third, who was rash enough to follow, would also have perished if he had not been quickly drawn up again, and, as Izacke tells us, he was restored, when half dead, "by roulng and pouring oyl and aqua vitæ into him." On coming to himself after this peculiar treatment, he "did affirm that there came such a strange stench out of the caverns of the earth as that deprived him of breath. Hereof diverse men censured diversely; some that there was a cockatrice in the pit, some one thing, some another, but the general received opinion that it was occasioned by a Damp." In these days we should say it was carbonic acid gas.

Another heraldic sign was the *Blue Boar*, which elderly citizens can still remember, painted on a board in front of a public-house adjoining the Eye Infirmary in Magdalen Street.† This was one of the badges of Richard Duke of York, father of Edward IV. The royalist tendencies of the citizens were shown by the *King John Tavern* in the serge market at the head of South Street; the *Plume of Feathers*, at the bottom of North Street; the *Unicorn*, in the Butcher Row; the *King's Head*, formerly in Spiller's Lane; and the *Crown and Sceptre*, in North Street. The favourite sign of the *Royal Oak*, of which an example yet exists in Guinea Street, plainly refers to the tree whose branches hid Charles II. from his enemies at Boscobel. Many of the *George Inns*, so common throughout the country, were doubtless so named in compliment to our Hanoverian Kings; but the *George*, in North Street, must be traced to an older source, for it is mentioned, in 1582, as lately belonging to the Prior of Plympton. There is a *George Inn* at Salisbury, which was known by this name in 1406, and, like that of Exeter, it probably refers to

* Ed. 1677, p. 160.

† This may possibly be the house referred to in John Hoker's MS. book at the Guildhall, in which he inserted a "Copie of the Blacke Roll by w^h the Byshop claymeth his fee to be in the Cite of Exon and the suburbes of the same called St. Stephens fee and made in the xiiij yere of Henrye iiijth or rather Edwarde the iiijth—It'm. The howse or tent^e of William Wonarde wth twoo shoppes adioyninge wthin [without!] the South Gate of Excet^r to the signe of the bore that nowe inhabiteth John Darke hosteller, late of John Somer," &c.

the patron saint of England.* The *Ship* in St. Martin's Lane, the *Three Mariners* (afterwards the *Cornish Inn*) without the Water Gate, and the *Blue Anchor*, in High Street, the scene of a disastrous fire in 1669,† testified to the spirit of maritime adventure animating the leading merchants of Exeter. The woollen trade naturally suggested many subjects for signs, such as *The Fleece*, by North Gate, and the *Bishop Blaize* or *St. Blazius*, the patron of woolcombers, who appeared in painted effigy over the doors of more than one inn in Exeter. That in St. Sidwells was sold by auction in 1790, but a degenerate specimen may still be seen in the Commercial Road. The *Saracen's* or *Turk's Head*, the sign of an ancient but still existing inn, adjoining the west side of the Guildhall, comes down to us from the Crusades, or as probably from the times when the pirates of Algiers were the terror and scourge of our seamen. The *Blackmoor's Head*, near Westgate, may also owe its origin to these corsairs. There is an advertisement of this alehouse in an old newspaper, which shows how keen was the competition amongst innkeepers so long ago as 1715. The landlord announced, that "at the *Blackmore's Head*, near Westgate, any of the inhabitants of this City may have Stout, Ale and Beer without doors for Twopence per Quart, and in his House for Threepence per Quart. N.B. As a Gratuity the Landlord presents his *House Customers with Pipes and Tobacco*, and such Estables as his House does afford, *Gratis*." The *Three Cranes* was a favourite London sign, and one might be found in South Street, Exeter, only a few years ago. It has been said that it originated in the punning propensities of our ancestors, who represented by the three birds the tripod or crane used for lifting their wine barrels. The potent ecclesiastical element in Exeter was very fully represented in its inns. Nearly all its numerous church towers threw their friendly shade over a tavern, and one or more might always be found nestling near to each of the five gates of the Cathedral Close. The *Peter Bell*, at Palace Gate, taken down to widen the street in 1811, and the *Cross Keys* from the arms of the Bishopric, have already been mentioned. Both of these were flourishing taverns very early in the last century, and the latter was advertised to be let in 1715. Of this class also was the *Bell*, in St. Edmund's, and the *Ring of Bells*, which till lately

* MACHYN'S *Diary*, p. 170, and *Notes*, p. 365 (Camden Soc. Pub.), mentions a George Inn in Lombard Street, London. Stowe adds that it had been the town mansion of the Earls Ferrers.

† LACKE'S *Memorials*, p. 173; JENKINS' *History*, p. 176.

displayed a pictorial sign in West Street. But the most noticeable of ecclesiastical signs was the common one of the *Salutation*. One of these, still retaining its ancient pillared porch with a chamber over, exists at Topsham; but the Exeter *Salutation* comprised the rooms over the arch, and in the round flanking towers of East Gate. It has been supposed that this sign originally referred to the Angel's salutation of the Virgin, but as the Puritan thought this savoured too strongly of popery, the sign was in many places repainted so as to represent two fine gentlemen bowing and scraping to each other. The liquor trade had its emblems in *The Vine* and in the *Grape*, mention of which latter, as well as of *The Vintage*, in High Street, is found in an advertisement of 1715. The *Rummer Tavern* occurs in others dated 1728 and 1752. This and the *Three Cups* were in the Cathedral Close, or St. Peter's Churchyard, as it was commonly styled. Of astronomical signs there were the *Sun*, at East Gate, the starting-place of a Bath and Bristol coach in 1727; the *Half Moon*, in High Street, where Sir William Pendarves, M.P. was lodging in the first year of the last century; the *Star*, adjoining St. John's Bow, so named as early as 1680, but of late years converted into a shop; the *Seven Stars*, in St. Thomas, has stood there for more than two centuries, whilst the *Globe*, in St. Mary's Yard, existed as a tavern at least as early as 1726. Nearly all these date from times when the heavenly bodies were regarded with mysterious awe, indeed they may possibly be survivals from an age when those luminaries were objects of pagan worship. Of all the animals displayed on the inn signs of Exeter, horses were the most numerous. A *Pack Horse* still exists adjoining St. David's Churchyard, and the landlord of another in St. Thomas hung in his bar the prudent motto—

"I've trusted many to my sorrow;
Pay to-day and trust to-morrow."

But the signs of horses did not admit of the same strange variety of colour as the lions. There was a *White Horse*, in or near St. Martin's Lane, in the reign of Henry VIII,* and another stood in the parish of St. Paul in 1575. There were also two *Black Horses* of early date, one in St. Sidwell's, and another in South Street. In the last-named street was a very singular member of the species—the *Sea Horse*. Another

* I meet with this in an account of Leonard Thomas, collector of rents in Exeter, for the heirs of Thomas Giffard, Esq., up to Michaelmas, 29 Henry VIII., wherein he mentions the receipt of 13s. 4d. from James Gatemaker, for rent of two houses lying near the Whytehorse.

was to be found at Plymouth in the reign of Elizabeth (1587). This was not the animal mounted by the Horse Marines; it was more probably the creature which figures in the arms of the Tucker family. The *Black Horse*, in St. Sidwell's, was burnt down in 1789, and a private house built in its stead. To the one formerly standing in South Street a tragical story is attached, and I have procured from the Bodleian Library at Oxford a transcript of the only known copy of the curious tract in which this story is narrated. It is entitled "The Great Robbery in the West; or, The Innkeeper turn'd Highwayman. A perfect Narrative how an Innkeeper neer Exeter, Drawing in two others into his Confederacy, Lately Robbed the Exeter-carrier of Six hundred pounds in Money, and for the same were executed at the said City the 13th of this instant August, 1678. With the remarkable Speech of the said Innkeeper on the Ladder." *

It appears that amongst the many malefactors tried at the county assizes in Exeter, in that year, was one John Barnes, who had long lived in good repute as the keeper of the *Black Horse Inn*, near Southgate. He is said to have been "a great pretender to religion, and a constant attender of Private meetings;" but about a year before his conviction he took an inn at Cullompton, where he threw off his "Religious Mask" and ran into debt and evil courses. One of his creditors was a smith, "a stout fellow of good natural courage." Instead of paying what he owed like an honest man, Barnes persuaded the smith to join in an enterprize, which he promised should not only restore his money, but "make him a man for ever." A worsted comber was also prevailed on to join in the plot. The confederates, having ascertained that "the Exeter carrier had a great charge of Money to convey up to London, they, at a convenient place called *Honiton Hill*, set upon his Men and took from them no less than six hundred pounds in ready Money." The carrier's men having identified them, "they were all three in short time after apprehended and committed to Gaol, where, by the Innkeeper's Advice, and his Fellow-prisoner's skill, they got off their Fetters, or so much of them, that they broke the Prison by Night and got abroad." One of them escaped, but the other two, including the innkeeper, were retaken the next morning, and both were sentenced to die. The narrative proceeds to state that "there were many Women of Quality in Exeter that made great intercession for the said innkeeper to get him a Reprieve, not

* This title will be found in the late Mr. J. DAVIDSON'S *Bibliotheca Devoniensis*.

so much for his sake, as out of charity to his poor innocent Wife and Children; for she was generally reputed a very good, careful, industrious, and pious Woman, and hath no less than nine very hopeful children; but the nature of his Crime excluded him from Mercy in this World, so that he and his Comrade were on Tuesday, the thirteenth of this instant August, conveyed to the usual place of Execution, where there were two that presently suffered; but the Innkeeper, desiring two hours' time the better to prepare himself, had it granted, which he spent in Prayer and godly Conference with several Ministers; then, coming upon the ladder, he made a large Speech, wherein first he confessed not only the Crime for which at present he suffered, but likewise divers other sins, and particularly lamented that of Hypocrisie, earnestly begging the Spectator's Prayers, and exhorting them not to despair in any condition, but trust to the providence of God, rather than to take any indirect courses to supply their seeming necessities, acknowledging that his failing herein had brought him to this untimely end. And so with all the outward marks of a sincere Penitent, submitted to his Sentence, and was executed."

Dr. Lake, whose *Diary* has been published by the Camden Society, happened to be visiting a prisoner in the gaol when Barnes and his accomplice were brought in. The doctor somewhat maliciously observes that he was "a notorious Presbyterian who had been prosecuted in the Consistory for not bringing his children to church to be baptized," and that "the evening before hee went forth to execute his design hee pray'd with his family two hours."*

Canine signs were not numerous in Exeter, but the *Black Dog*, still pictorially represented on the front of an inn in North Street, is referred to in a deed in the Guildhall archives by which, on the 6th May, 1658, Richard Martin, Esq., of Lindridge, sold to Elizabeth Flay (the well-known benefactress) a half acre plot without Northgate (on which was a messuage called the Black Dog, lately consumed by fire), in St. David's, next the highway to Cowley Bridge, on the north part.

Of the inns bearing signs of miscellaneous character may be mentioned *The Phoenix* in High Street, midway between Goldsmith Street and the fish market, whose site is now absorbed in Queen Street. It enjoyed a flourishing reputation all through the last century; for we find by newspaper advertisements that it changed hands in 1726, and was offered

* The parish register of Holy Trinity, Exeter, records the baptisms of three children of John and Mary Barnes in 1670-1671 and 1675.

for sale in 1801. Earlier mention is found of *The Oatsheaf*, still occupying its ancient position in Fore Street, next below St. Olave's Church, and possessing a feature by which nearly all the ancient inns of Exeter may be recognized; viz., a covered way corresponding in height with the ceiling of the ground-floor rooms, and leading to a yard in the rear. The Oatsheaf, or Oatensheaf, as it was sometimes called, figures conspicuously in the accounts of the wardens of St. Olave's, as the place where the parish dinners were held on procession days (Ascension-day). Its sign was no doubt derived from the oat market, formerly held in the open street in front of the inn, but removed, in 1783, by order of the Chamber, to the market provided for oats, vegetables, fish, &c., behind the Swan Inn, in High Street. The parish accounts show that the tolls of the oat market were taken in kind by the wardens of St. Olave's in the middle of the seventeenth century, and were afterwards let by them at an annual rent. *The Elephant*, in North Street, another old inn presenting the characteristic feature of a covered way, is mentioned at least as early as the beginning of the last century, whilst *The Fountain Inn* or tavern, which has long ceased to exist, stood, in 1715 and long after, a little below the junction of Fore Street and South Street. It is probable that its sign was derived from the conduit at Carfoix, which stood close by in the middle of Fore Street until the year 1770.* At the *Anchor Inn*, in Exe Island, it was the annual custom to celebrate by a feast Lord Rodney's victory over the French in 1782, and on these occasions it was usual to display a transparency representing the event. George Pyne, the landlord, had his son christened George Rodney, in honour of his hero.

A few inns mounting signs of more or less eccentric character were also to be found in Exeter. Of these was *The Knave of Clubs*, a substantial edifice overlooking the Exe, where it is joined by the Sutbrook (South Brook), which flows down the Barnfield and Holloway valley. The parish books of St. Leonard show that this house was "newly-built" in 1725. By the beginning of the present century it had lost the title of the Knave of Clubs, and not many years since it was pulled down, and its site incorporated by Mr. J. C. Bowring with the grounds of Larkbear House. *The Round Tree Inn*, one of the few still displaying a pictorial sign, is mentioned in an advertisement of 1727. It then stood in Exe Island, but was cut off from it in 1770 by the viaduct of

* A somewhat fanciful suggestion as to the origin of the sign of the Fountain is given in *The History of Sign Boards*. Hotten, p. 494.

Bridge Street. The *Early Bird*, which existed in Pancras Lane in the middle of the last century, was probably a house of call for artizans on their way to work in the dawn of morning. The *Hole in the Wall* stood on Fore Street Hill within the memory of old citizens. An open court in its front is now occupied by the shop and dwelling of Mr. Stephens, statuary, whilst the inn itself stood in the rear on the site of the present workshops. The *Fortune of War*, on the arches of old Exe Bridge, was a resort of common vagrants, who were lodged there in great numbers at a penny a night. Upwards of thirty were there on the 12th of December, 1775, when a fire broke out between six and seven in the morning, and quickly destroyed the crazy tenement. Nine dead bodies were dug out of the ruins, and three other of the lodgers were carried, horribly scorched, to the hospital. The cause of this fire merits a brief notice as illustrating the change which the lapse of a century has effected in minor matters of household convenience. It appears that some of the lodgers were engaged in manufacturing matches out of thin slips of deal, about six inches long, by dipping the points into melted brimstone. The vessel of brimstone, boiling over, took fire, and hence the catastrophe. The hawking of penny bundles of these matches was a trade almost exclusively exercised by tramps, and was generally a mere cover for begging. The housemaid's flint and steel, and tinder-box, by which a light was obtained with so much difficulty, vanished on the invention of lucifer matches. Any that may still exist would form fit objects for a museum as relics of a bygone practice. Another curious sign was *The Devil upon Dun*, which stood in Catherine Street on the site of a house formerly occupied by Mr. John Cousins, brother of the famous engraver and Royal Academician. The deed of conveyance, by which Mr. John Cousins acquired the premises in 1837 from John Tompson, recites that "Whereas Elizabeth Flay (whose portrait is in the Guildhall) formerly of the city of Exeter widow (of Thomas Flay alderman) by indenture dated the 30th day of January 30 Charles II granted and demised to George Tuthill of the city of Exeter esquire amongst other lands three several stables and one courtlage situated in the parish of St. Laurence in the said city then late the inheritance of John Levermore gent. deceased for the term of 999 years from the death of the said Elizabeth Flay under the yearly rent of £26 and whereas by divers mesne assignments the said hereditaments became vested in Sir Edward Seaward of the said city Knight for the residue of the said term and whereas the

premises were afterwards converted into a dwelling house with a cellar and one stable and were used as an inn called the Devil upon Dun." Sir Edward Seaward, whose mural monument may be seen in St. Paul's Church, Exeter, and who died in 1703, sold the premises, in 1701, to Charles Knowles. It may be fairly conjectured that the sign of the Devil upon Dun may have originally represented St. Dunstan pulling the devil by the nose, a sign which existed in London, near Temple Bar, in the reign of James the First.

The oldest of Exeter inns having anything like a connected history, was known for centuries by the inappropriate title of the *New Inn*. We may enter it now without any suspicion of its antiquity. Of the ladies of the present day, who are so familiar with the house, which bears over its alluring portal the name of "Green and Son," probably not one in a hundred suspects that her ancestors knew it equally well as the principal inn in Exeter. The archives of the Corporation and of the Dean and Chapter, to whom it jointly belonged, make frequent mention of the *New Inn*, the earliest being a lease of 1456, by which the Master and Brethren of the Magdalen Hospital granted to Roger Schordych and Joan his wife, two tenements opposite "le Newe Inne," in the parish of St. Stephen. It appears from Shillingford's *Letters* (p. 85), that the inn was then "newly built," and one of the frequent squabbles between the cathedral and the city authorities arose out of a "purpresture" or encroachment said to have been made there by the Chapter. A few years later, as we learn from Mr. Cotton's *Gleanings* (p. 11), an entry was made in the accounts of the Receiver to the Chamber of 3s. 4d., disbursed for "four gallons of wine sent to Lord Stafford at the Newynne." From this time it often occurs on successive renewals of the lease. In John Hoker's extracts from the Act Books of the Chamber, we find that on the 16th February, 1554, during the mayoralty of John Midwinter, that body resolved to establish at the New Inn the cloth mart previously kept at the Eagle from 1472. "The newe Inne to be bought of Christian, the wydowe of Thomas Petefyn, and the same to be converted into a commodious hall for all manner of clothe, Lynnen or wollyn, and for all other m'chandises and w^{ch} shalbe called the m'chaunts hall." In pursuance of this arrangement, Edward Clase and Elizabeth his wife, who had succeeded Thomas Peytevin, surrendered their lease to the Chamber in 1555. The Act Book also shows that Thomas Johnson was deprived of the tenure of the New Inn on the 25th July, 1582, and was succeeded by Valentine Tooker (or

Tucker). This tenant had a misunderstanding with the municipal authorities, in which he induced some of his mercantile customers to take up his cause; for amongst the municipal records is a letter addressed to the Chamber on the 20th of June, 1612, in which Matthew Springham, Walter Clarke, John Pettye, and 18 other London merchants, intercede for Tooker, who had received notice to quit his "nowe dwelling howse, the Newe Inn;" and they pray that in consideration of his years and services "some stipend may be given him." Shortly after this Valentine Tooker died, and in 1617 his sons, Thomas and Samuel, state, in a letter to Ignatius Jurldaine, the mayor, that their father had recovered £43 13s. 4d. from the Chamber by a Decree in Chancery for being compelled to leave the Newe Inn, of which he had been tenant for many years, and they desired that it might be paid without putting them to the charge of taking out the Decree under the Great Seal. They thought it hard that their father should, without any just cause or indemnity, be thrust out of doors "after keeping the New Inn for more than thirty years, behaving himself honestly and paying his rent duly, albeit two or three several times rayased and enhanced therein on the promise afterwards to enjoy it for his life." Notes are added in favour of the petitioners by the brothers Richard and Symon Baskerville. This Simon Baskerville, a near relative of the mayor, was a man of note and influence at this time. He was the son of Thomas Baskerville, an Exeter apothecary, and was born in the city in 1573. He was successively appointed physician to James the First and Charles the First, from the latter of whom he received the honour of knighthood. A mural tablet in St. Paul's, London, records that "Near this place lyeth the body of that worthy and learned gentleman, Sir Simon Baskerville, Knight and Doctor in Physick, who departed this life the fifth of July, 1641, aged 68 years." The transactions between the sons of Valentine Tooker and the Chamber appear to have closed on the 3rd of April, 1618, when they acknowledged the receipt from that body of £6 16s. "in full satisfaction, recompence and payment, of and for the full and uttermoste value of all those selynges, stayned or paynted, clothes, shelves, and all other goods, chattels," &c., left by them in the New Inn.

After the year 1612, we find many references to the "New Inne Halle" or Merchants' Hall. This was let separately from the inn, and was used as an Exchange, where the cloth merchants congregated, and where the three great yearly cloth fairs drew together traffickers from all parts to carry on

the trade previously conducted at "le Egle," opposite the Guildhall. These merchants rented stalls or shops, which were also distinct from the inn, and in 1640 they petitioned the Chamber to prevent "foreigners," by whom they meant non-residents, from buying and selling to one another in the city. They suggested that "the hygher roome of Sent Johns [Hospital] be ordenyd to be a store as a roome annyxt unto the New In halle, to reseve all wols brought unto thys cyttaye by foreners." These restrictive and protectionist measures, operating with the introduction of steam power, finally caused the great woollen manufacture of the West to depart into districts where trade was freer and coal was cheaper.

The New Inn extended as far back as Catherine Street, including what was till lately Mr. Seller's coach factory. Perhaps the sole relic of the original structure is the well in the cellar under this part of the old premises. When this well was opened, in May, 1872, its circular wrought courses of red sandstone plainly testified to its antiquity. The stabling was on the other side of Catherine Street, on a site still used for that purpose, and belonging to the Duke of Bedford. A fire broke out in these stables in 1723, and their great extent is shown by the following advertisement in Andrew Brice's *Postmaster; or, Loyal Mercury*: "Whereas there has been a Report industriously spread abroad by certain malicious or designing persons, that all, or most of the Stables belonging to the New Inn, in the High Street, Exon, are burnt down;—this is to certify that the said Report is vicious and false, there being but one only Stable any way damaged by the said late Fire; and that there are remaining near Three times as much Stable room as belongs to any other Inn House in that City, with handsome Accommodation for Coaches, &c., and above an Hundred Horses."

The structure already referred to was the first edition of the New Inn on that site. About the time of the Restoration of monarchy the house appears to have been rebuilt, and then was erected the great *Apollo Room*, which still remains the chief ornament of the house. This splendid apartment is 32½ feet long by 23½ wide, and before the floor was raised by Messrs. Green to increase the height of the shop below, it was 17 feet high. The original contract for the construction of the rich and elaborate ceiling appears to have been made with the Chamber by Richard Over, who was to receive £50 "for his skill and labour in playstering the fore chamber, or dining-room, in the New Inn according to

the form and mould which he hath propounded and laid down in a scheme or map." But the work appears to have been begun in 1689, by Thomas Lane, a plasterer, for five shillings a yard, and on the following 20th of March he was paid by the Chamber £50 for this admirable work of art. It displays the royal arms, with those of the See of Exeter, and of the county families of Hillersdon, Calmady, Prestwood, Acland, and Radcliffe. The name of this fine room may possibly have been borrowed from the Apollo Club, in London, near Temple Bar, a place of great resort in the reign of James the First. Its principal room was called the Oracle of Apollo, the bust of the god being set above the door of the room, whilst over the entrance to the house were some verses beginning—

"Welcome all who lead or follow
To the Oracle of Apollo."*

Perhaps our county magistrates sought his inspiration when they met at the New Inn for public business. Amongst the many illustrious visitors who have been lodged there none ever excited more curiosity than that great potentate, Cosmo III., Grand Duke of Tuscany, who came with an imposing retinue, on his way to London, in the spring of 1669. The mayor and aldermen waited on him in full state, and were received in a saloon above stairs, perhaps the one that was afterwards converted into the Apollo Room. His highness graciously desired the mayor to be covered, listened patiently to the inevitable speech or address, accepted the gift of money (£20), which it was then customary to present to great personages, but politely declined his worship's invitation to a banquet. The Grand Duke afterwards received Sir John Rolle and his two sons, John and Denys, and on the next day returned the visit at their house in the Close, formerly the town mansion of the Abbot of Buckfast, and now occupied as a school by Mrs. Hellins. The fortunes of the *New Inn* began to decline when the Cloth Fair was removed to St. John's Hospital, in 1778, and its decay was probably hastened by the rivalry of the *London Inn*, now the *Bude Haven Hotel*. In his *Grand Gazetteer*, published a little before this time, Andrew Brice describes the *New Inn* as "not undeserving mention, not only as having most or all the Properties of an Inn super-excellent, but especially for one most magnificent lofty and large room, called the *Apollo*; the Fellow of which scarce any Inn in the Kingdom can truly

* *TIMBS'S Clubs and Club Life*, p. 9.

boast. It's the property of the Chamber. Herein is kept the present Cloth Hall, and at Whitsuntide fairs the whole Court and nearly every Room are filled with Clothiers and their wares. It may casually be acceptable to some or other of the *worthy Fraternity* to note also that the said APOLLO is the only constituted LODGE of *Exeter FREEMASONS*." When the testy but clever author of this description ended his long life in 1773, two hundred of his brother Freemasons, members of several lodges, met in full costume at the Apollo Room, and joined the funeral procession to St. Bartholomew's Yard, singing as they went a solemn Masonic elegy, composed for the occasion. It was probably not long after this event that the premises ceased to be used as an inn; but the judges of assize continued to be lodged there until about the year 1836, when they removed to Northernhay Place. In a large upper room, in the rear of the New Inn premises, the first popular Literary Society in Exeter held its meetings from the year 1830. It was founded five years earlier in some rooms in South Street, under the title of a Mechanics' Institute. Soon after the termination of its brief but useful existence its place was supplied by the still flourishing Exeter Literary Society.

Next, if not equal, in importance to the New Inn was the *Mermaid*, whose yard is now worthily occupied by two huge blocks of Industrial Dwellings. There was a great oaken staircase, with carven handrail and ample landings, leading to the assembly and other large rooms for the quality folks, on the left of the entrance. Dr. Oliver, in a contribution to a newspaper in 1833, mentions this assembly-room as having been used for balls within the memory of old people then living. It was 56 feet long and 17 wide. Its arched and moulded ceiling was enriched with gold and colour. On a carved stone in the centre of the mantelpiece (30 inches wide by 25 high), and dated 1632, were impaled the arms of the old Devonshire families of Shapleigh and Slanning. Travellers and casual guests were lodged on the left side of the entrance; and besides the spacious yard there was a large garden with a summer-house, commanding a prospect of fields and distant hills. Here the city merchants could look down upon their ships in the haven below, as they smoked their pipes over cups of canary, and held converse touching their foreign ventures. The *Mermaid* was a favourite sign with our forefathers, who had a liking for strange fishes, especially for those connected with fable or mystery. An old book tells how, once upon a time, a long consultation on the choice of a

sign ended in the selection of *The Mermaid*, "because," said the hostess, "she will sing catches to the youths of the parish."* Not from the parish only, but from every quarter of the county, did customers of high degree make their way to the Mermaid of Exeter. *They* sang catches if *she* did not. "What things we have seen done at the Mermaid!" wrote Beaumont to Ben Jonson. Those dashing brethren, Sir Peter and Sir Gawen Carew, with a gallant company of knights and squires and justices of the quorum, rode into its yard, in 1549, after conference with the misguided Catholic insurgents at St. Mary's Clyst, and there, after supper, words waxed high over the terms of dealing with the rebels.

During the whole of the last century the Mermaid was a great rendezvous for carriers; and Edward Iliffe, to whom it belonged in 1764, was a partner with Thomas Parker of the New Inn, and two others, in one of those long vehicles then called "machines," advertised to carry passengers from Exeter to London in two days. Iliffe had also "fly waggons," which performed the journey in four and a half days, setting out from the Mermaid every Monday, Tuesday, and Thursday. It may be doubted whether this promised speed was maintained, for, in the course of some alterations of the covered entrance in 1825, discovery was made of a board announcing, under the date 1780, that "Iliffe's Flying Van leaves this yard every Monday morning for London, performing the journey in six days." Edward Iliffe sold the Mermaid, about the year 1810, to Thomas Bury, a woolstapler, who erected for himself a substantial brick dwelling in the yard. Iliffe prospered in his business, and ended his days at Exmouth, where he lived at Sacheverall Hall with the title of Esquire, and a mural tablet to his memory may yet be seen in Littleham church. In later times the yard became the site of a brewery, carried on successively by Mr. Joseph Brutton and the father of the late Mr. John Clench. All traces of its former state are now obliterated, and the Mermaid no longer "sings catches to the youths of the parish."

But although the Mermaid has completely vanished, its rival, the *Dolphin*, over the way, still retains the name, and little but the name, that was once so widely known. Francis Pengelly, an Exeter apothecary, its owner at the beginning of the last century, gave it in charity to trustees for certain benevolent purposes, which were not to take effect until after the death of Joan, his wife. Once, in 1725, the Dolphin happened to remain unlet for a week, and was kept open by

* *History of Signboards*, p. 226.

the trustees. Their accounts show that during this short period there came carriers from Moreton, Yeovil, Ashburton, Totnes, and Okehampton, with fifty-six pack-horses amongst them. The regular charge was sixpence per night for each horse. A century before this the Dolphin, like the Mermaid, was frequented by guests of a higher class. Amongst the documents preserved in the Record Room of Exeter Guildhall, are some lengthy depositions of witnesses on a charge of murder, supposed to have been committed by some of these. From their testimony may be gleaned the following condensed outline of the story. It appears that on a January night, in the year 1611, there was staying at the Dolphin Sir Edward Seymour, of Berry Pomeroy, the first Devonshire member of the new order of baronets created by James I. as a means of raising money for his royal needs without the aid of Parliament. Sir Edward was seated in an upper chamber, playing at cards with some friends, when the party was joined by Master William Petre, a member of a distinguished family no longer connected with Devonshire, and by John and Edward Drewe, then of Killerton, but whose worthy descendants are now seated at the Grange in Broadhembury. One of the Drewes wore a white hat and cloak, the other was clad in black. Edward carried a short sword, and John a rapier. These three young gallants, already flushed with wine at the *Mermaid* and at the *Bear*, in South Street, drank "a pot or two of beer" and some more wine with Sir Edward Seymour at the *Dolphin*. Perhaps they were in too quarrelsome a mood to be very acceptable company, for after tarrying there an hour and indulging in a rude practical joke on the tapster, they remounted their horses, dropped in at a few more taverns, and finally rode out of the city through the East Gate. Here Will Petre spurred on at a reckless pace up the broad highway of St. Sidwell, and was soon lost in the darkness. The Drewes gave chase, but stopped at St. Anne's Chapel, and shouted to their companion by name. Receiving no answer, they groped their way to a house where a light was burning, but the woman of the house had seen nothing of Will Petre. They rode on to his home, at Whipton House, and there found his horse standing, riderless, at the gate. Edward Drewe deposed that "he took the horse by the bridle, and with his foot, as he sate on horseback, knocked at the gate, whereupon a servant of the house came forth and opened the gate. He (Edward Drewe) then willed him to take of him his master's horse, and then the servant demanded where his master was." Drewe, contenting himself

with the answer that he thought he would come by-and-by, rode on with his brother to their home at Killerton. The dawn of Sunday morning showed the dead body of Will Petre lying by the causeway near St. Anne's Chapel, with a ghastly wound on the head. The hue and cry was raised, and the two Drewes were taken as they lay in their beds, and brought before the city justices on the charge of murdering their friend. Some of the witnesses testified to a quarrel between Edward Drewe and Will Petre; but, though the papers do not disclose the issue of the trial, I think it must have ended in the discharge of the accused.

The *Bear Inn*, where the three roysterers had called for a quart of wine, was in South Street, at the lower corner of Bear Lane. It probably took its name from the Bere or Bear Gate, which was so styled in 1286, when the Cathedral Close was first surrounded by a wall. It was rebuilt in 1481, and was then the town mansion of the abbots of Tavistock, the wealthiest, if not the oldest, of the monastic houses of Devonshire. It is described as "le Bere Inne alias Bere" in the lease, by which John Peryn, the last abbot, in view of the pending dissolution of his house, leased it, in the year 1539, to Edward Brygeman and Jane his wife, for a term of sixty years. King Henry VIII., on the 30th January, 1546, granted the freehold of the premises to William Abbot, Esq., by whom, on the 15th February, 1548, they were sold to Griffin Amerideth and John Fortescue, who, on the 28th October, 1549, renewed the lease granted by the abbot to Edward Bridgman. Shortly afterwards the property was held in moieties, one of which belonging to William Buckenham, Mayor of Exeter in 1541, was, in pursuance of his will, together with the other moiety which he purchased of Edward Ameredith in 1565, conveyed by Buckenham's executor, Philip Chichester, on the 6th of March, 1566, to the mayor, bailiffs, and commonalty of the city of Exeter, for the benefit of the poor persons lodged in the Twelve [Ten] Cells in Billiter Lane, now called Preston Street. Prince, in his *Worthies of Devon*, published in 1701, tells us that the arms of Tavistock Abbey, and of Ordgar, its founder, were "to be seen in painted glass in the great window of the dining-room," with the figure of a man standing on a bridge. This was no doubt a rebus on the name of Bridgman, the former owner. Even so late as the beginning of the present century, when Jenkins wrote his *History of Exeter*, he could remember that a "great part of the old buildings, particularly the chapel, was standing a few years since; they

were built with freestone, of excellent gothic workmanship, decorated with fretwork panels. Mutilated inscriptions and different sculptures were seen, and over the cornice, even with the battlements, was a cabossed statue of a bear, holding a ragged staff between its paws." Dr. Shapter is the fortunate possessor of some admirable sketches of bits of the old building from the pencil of the late John Gendall. These show the heavy stone arches of the basement, and a massive stone spiral staircase leading to the floor above, evidently portions of the structure rebuilt in 1481. When newspapers began to be published in Exeter, early in the last century, The Bear appeared now and then in their quaint advertisements, and, like the Mermaid and the Dolphin, it became a noted house for carriers. One of these advertisements announced, in July 1722, that "Since the widow Wibber has left THE BEAR, for the Better Accommodation of Merchants, Tradesmen, &c., who frequent the Serge Market, at THE MITRE, in the same Street, is commodious Entertainment for Man and Horse by Henry Dashwood." Simon Phillips advertised that he had taken The Bear in 1779, and when he died, in 1796, Mary, his widow, continued the business. She kept it until it ceased to be an inn, and Robert Russell remodelled it for his great waggon establishment. This gentleman, familiarly known as Robin Russell, offered to assist the Government with three hundred draught horses at the time of the threatened French invasion in 1798. He became wealthy, built himself a house called Russell House, on the quay at Exmouth, and finally died there in 1822 at the age of 63.

Like its opposite neighbour, The Bear, the *Black Lions* in South Street was once an ecclesiastical residence. The Prior of Plympton, who owned extensive house property in the immediate neighbourhood, took up his abode there when he visited the cathedral city. Adopting the practice of other heads of religious houses, the last Prior of Plympton provided against the coming storm of the dissolution by leasing his house, for a consideration, to one John Alyn, of Exeter.* It is just possible that the *Black Lions* may have been for a time the town residence of the Carew family, whose shield of arms bears *three lions passant, sable*. When the inn was burnt down, in September, 1873, the strong side walls, which prevented the fire from spreading to the adjacent buildings, afforded glimpses of some gothic windows, and other traces of its ancient ecclesiastical state, and a carved stone on the front of the building displayed the figure of an angel with a

* OLIVER'S *Monasticon Dioc. Exon.* Plympton Priory.

shield, bearing a date which Jenkins interpreted to be 1421.* The *Exeter Flying Post* mentions that in July, 1834, "a curious brass religious tablet, about 1½ inch square, was found in digging underneath the foundation of the Black Lion Inn, South Street. It bore figures of the Saviour and Virgin, and some Greek letters." [This is probably inaccurate as to the Greek letters. The seal of Plympton Priory bore on the obverse the figure of the Virgin with the divine Infant on her knee, and holding a hawk in her hand.]†

That the *Black Lions* was one of the many South Street Inns which afforded accommodation for carriers is shown by the following advertisement of 1721 :

"John Legg, who lately kept the *Lamb Inn* in Southgate-street, Exon (the said Inn, &c., being purchased in order to be converted to a Private House), is removed to the Black Lyons by the Serge Market in the same Street, which latter being completely repair'd is render'd handsome and commodious for Entertainment of Man and Horse and where all his Customers shall have civil usage and a hearty Welcome.

"N.B. Robert Bath, Gloucestershire Carrier, who has Inn'd at the first mentioned House for 20 years past, has also taken up his quarters at the latter ; and carries Goods to or brings from Bath, Gloucester, Oxford and all adjacent Towns, and continues to buy and sell most sorts of Wool. John Vincent, the Taunton Carrier, likewise Inns there, together with John Blamey, the Cornish Carrier, and Roger Newman, the Colliton Carrier ; John Hart, the Axminster Carrier ; Thomas Steward, the Lyme Carrier, all who will continue to come in and set out at the usual times as formerly at the Lamb."

Comparatively little is known of the history of *King John's Tavern*, opposite the Cathedral Close Gate called Little Stile, in the part of South Street formerly called Cook's Rew. It was one of the finest houses in Exeter, being of early Tudor date, with a tall square front, the projection of the upper storey over those below receiving support from oaken corbels grotesquely carved into human or diabolic forms. Two of these guarded the entrance doorway, as represented in an engraving published in the *Gentleman's Magazine* of May, 1838, shortly after the front was taken down. The figure on the right was that of a porter or doorkeeper, wielding a mace, and surmounted by a shield with the royal arms. The other figure represented one of those domestic fools or jesters, with

* JENKINS' *History of Exeter*, p. 376, has a description and rude engraving of this stone.

† OLIVER'S *Monasticon*, p. 132.

cap and bells, who were often found in the retinues of great nobles in the Tudor reigns. Over the jester's head was a shield charged with the arms of the city. An important feature of the house was the massive oaken staircase under a vaulted and richly-moulded ceiling, with drooping pendants, as illustrated in Mr. Cotton's *Elizabethan Guild*. It is not clear why the name of a monarch so unpopular as King John should have been chosen for a tavern here, as well as in London and elsewhere. When our Hanoverian Kings came in, a loyal owner re-named it King George's Tavern, and it was known under this name until George III.'s reign, when the older title was resumed, and continued to the end.

Of a somewhat different sort was the *Seven Stars*, in St. Thomas. It dates from the seventeenth century at least; for George Fox, the founder of the Society of Friends, wrote in his journal that, in 1657, he put up "at the sign of the Seven Stars, an inn at the bridge foot, where we had a general meeting of Friends out of Cornwall and Devonshire." The large room where this meeting assembled was more often used for dramatic than for religious purposes. The earliest announcement I have met with of a theatrical entertainment in Exeter is an advertisement of 1725 of Punch's Theatre, which was set up at the Seven Stars, with artificial actors; also legerdemain, and a tumbling girl ten years old. A more pretentious performance was announced a few months later, when the "Bath Company of Comedians, Servants to His Grace the Duke of Grafton, acted at the Seven Stars, at the Bridge Foot in St. Thomas . . . a Diverting Comedy called *The Busie Body*." The parts were undertaken by six male and four female performers, and the versatile Andrew Brice wrote a prologue for the occasion. These theatrical advertisements afterwards became more frequent, and in 1728 we meet with an announcement of the performance, at the Seven Stars, of Gay's *Beggar's Opera*, only a few months after its first publication. The following advertisement, from *The Protestant Mercury; or, Exeter Post Boy*, published by Samuel Farley on the 17th January, 1715, refers to the Seven Stars, and proves also the existence of another ancient *New Inn* in the same locality:

"These are to give notice that Joseph Reynell, who lately lived at the *Seven Stars* in St. Thomas' Parish nigh Exon, is now removed to the *New Inn* nigh the Bridge End in the same parish, being the ancient dwelling house wherein Mr. John Bordall formerly lived and where all people shall have very civil and honest Entertainment."

We come nearer to our own times in treating of the two London Inns. The first of these occupied the entire frontage between Paris and Southernhay Streets, and its yard and stables extended far back in the rear, on ground now forming the sites of other buildings. Mention of the London Inn is found very early in the last century. Like the Rougemont of our own day, it owed its origin mainly to the demand for more modern conveniences than were afforded by the older establishments, such as the Mermaid, the Bear, and the Dolphin, and partly also to the increase of travelling by post-horses and wheeled conveyances. One of the many persons of note who stopped there was the Duke of York, brother of George III., who changed horses at the London Inn in 1763. Isaac Money Penny was then its landlord, and three years after this he advertised his Flying Post Coaches to London in two days. Money Penny died in 1770; and on the death of his widow, two years later, the well-known John Land came there from the Half Moon. During his twenty years' tenancy of the old London Inn, Land had the honour of entertaining many royal and noble guests. The king's brother, the Duke of Gloucester, stopped there on his way to Plymouth, in September, 1781, and after receiving the mayor and corporation, he accompanied them on foot to the Guildhall to receive the freedom of the city. In January, 1788, a great crowd assembled round the London Inn to see George, Prince of Wales, and his brother, the Duke of York. Here the royal guests dined, whilst the Cathedral and other bells rang in their honour, and a general illumination was added to the festivities when they returned from Plymouth a few days later. The Duke of York slept at the London Inn on the memorable occasion when his royal parents and sisters visited the city in the following year; and in February, 1794, the mayor and chamber went there to congratulate the Marquis Cornwallis, who had landed at Brixham on returning from his brilliant career in India. John Land was then busy in the erection of the *New London Inn*, on a site previously occupied by a smaller establishment called the *Oxford Inn*. Land removed to his new house in July, 1794, whilst the old one, passing into the possession of Mr. Thomas Pratt, was thereafter known as the *Old London Inn*. Mr. Pratt, dying on Christmas-eve, 1789, was succeeded by his widow, Elizabeth, and the business continued in their family until railways superseded the stage coaches, and the house was altered to its present form. John Land had already grown rich when he entered on his New London Inn. His name

and fame were familiar throughout the West of England. In the palmy days of coaching more than three hundred horses fed in the stables in Longbrook Street, which are now being converted to other uses. Post-chaises, stage-coaches, and private carriages, were coming and going all day long, and hardly ceased during the night. The London Inn Square provided cheap entertainment to the idlers of the city. The clatter of hoofs, the rattle of wheels over the stones, and the lively notes of the guard's bugle sounded from morning to night. In those days illustrious travellers were not hurried past Exeter in railway trains, but were seen of every wayfarer as they passed through its streets and drew up at the New London Inn, to take a meal, to spend a night, or merely to change horses for the next stage. Thus it was that the Grand Duke Michael, brother to the Emperor of Russia, was seen on his way to and from his visit to Lord Mount Edgumbe, in September, 1818. The great Duke of Wellington came in the following year, and was received with vast enthusiasm. The zeal of the populace was not equal to the task of dragging his carriage up the steep ascent of Fore Street Hill, but at St. John's Bow they took out the horses and drew it in triumph through a dense crowd to the New London Inn, the front of which was decorated with laurels and flowers. Less enthusiastic was the reception given to the young Don Miguel, in January, 1828, when he passed through Exeter, with a numerous suite, on his way to Plymouth, where he embarked for Lisbon to enter on a course of tyranny that drove out from Portugal thousands of the best and noblest of his subjects. Six months later many of these landed at Falmouth, and stopped at the New London Inn on their road to the metropolis. They were followed, in September of the same year, by the young Queen of Portugal, who was escorted to the same inn by the 4th Irish Dragoon Guards. On the next day she was received at the Cathedral by the Bishop and other dignitaries, and after remaining a short time at the Palace, took a drive in the neighbourhood.

The chief inns of the olden time performed another function that has utterly ceased since the advent of railways. In worthy John Land's day, when members of noble families died in London, their remains were conveyed by road in solemn procession to their country homes, and where the day's journey ended, they lay in ceremonial state at the principal inn. So it was at the New London Inn, when the Earl of Mount Edgumbe's remains were brought there in 1795; and again when the body of the countess, his daughter-

in-law, arrived from Tunbridge Wells, in September, 1806. On the evening of the 2nd of July, 1813, the remains of Sir Lawrence Palk, grandfather of the baronet recently created Baron Haldon, rested there on the way from London, and the next morning proceeded "with grand funeral pomp" to the family vault at Dunchideock. One hundred of the tenantry headed the procession on horseback with mutes and undertakers. Next came the plumed hearse and four mourning coaches, each drawn by four horses, followed by a long train of private carriages. About forty tradesmen on horseback closed the procession.

Some further notice is due to the career of John Land, whose name is so inseparably joined to the early history of the New London Inn. A tinted engraving which hangs in its bar displays his shrewd, kindly features, under a curled brown wig, as he often appeared to our grandsires standing under the portico of his inn. Commencing life as a pig-jobber, he rose by thrift and perseverance to the more exalted position of cattle dealer. If his calling was undignified, it sharpened his wits and filled his purse. It gave him that knowledge of character and experience in dealing with men which made him a successful innkeeper. These qualities were called into play on a great variety of occasions. In the year 1800, when the county grand jury assembled at the Lent assizes issued an advertisement signed by the high sheriff, and announcing that, Whereas Mr. Land and other Exeter innkeepers had raised their charge for port wine from 3s. 6d. to 4s. a bottle, they resolved to support any house that would supply good, sound port at the old rate; in the next week's paper John Land reasons with these convivial but frugal squires in an advertisement announcing that "he continues to sell *good, sound port wine* at 3s. 6d. a bottle," but adding that the expence of keeping it for several years, in order to render it of superior excellence, obliged him to charge 4s. for *old wine*, and he hoped the nobility, &c., "will consider that advance to be barely equal to the interest of money, and the loss by keeping a heavy stock so long to improve its flavour." By this argument his customers were probably appeased, for we hear no more of their objections. But, although worthy John Land was on familiar terms with the best of company, nothing pleased him better than to surround his table with a score of farmers and cattle dealers—friends of his early bullock-jobbing days. He would place before them his best fare, not forgetting the homely clay pipe and the rummer of grog, whilst his waiters were bidden to pay particular heed to their

comfort, and to charge them the price they would have paid at an ordinary public-house. As already stated, Mr. Land removed from the Half Moon to the Old London Inn in 1772, and from thence, in 1794, to the new one which he had built. After spending more than fifty years of his life as an inn-keeper, he died, at the age of eighty-seven, on the 24th of January, 1817, and was then reputed to be the oldest and wealthiest landlord in the West of England. His funeral was a truly marvellous spectacle. A number of mutes and undertakers preceded a hearse decked with plumes, and drawn by six horses. Next came eight stage coaches with four horses to each. These were followed by no less than fifteen post-chaises conveying innkeepers and other friends of the deceased from all parts of the country. After these walked six mail-coach guards in their brilliant scarlet and gold-laced uniforms; and the rear was brought up by a cavalcade of one hundred and sixty horsemen riding two and two. Such was the procession that attended the remains of John Land to his quiet grave at Pinhoe. It need scarcely be added that the imposing show filled the whole length of St. Sidwell Street with sight-seers. In accordance with his own wish, John Land was succeeded by his bookkeeper, Mr. John Clench, who remained for seventeen years, when Mr. John Cockram left his hotel at Teignmouth, in 1834, to assume the direction of the New London. After him came Mr. Pratt, from the Old London, and he was followed in 1868 by Mr. R. Pöple, the present proprietor.

Our final notice must be given to the inn now known as *The Clarence*. It was the first in Exeter, if not the first in England, to assume the French title of hotel, and in its early days was commonly referred to as *The Hotel* in the Churchyard. It was built about the year 1770, by William Mackworth Praed, Esq., a partner in the adjacent Exeter Bank, the oldest banking-house in the city. The first landlord of *The Hotel* was Peter Berlon, a clever Frenchman, who nevertheless failed in 1774, and was succeeded by one Connor, from the well-known Saracen's Head in London. Connor remained less than two years, and the house, which was still known as Berlon's Hotel, was entered on by Richard Lloyd, who had kept the old Swan Inn, in High Street, where Queen Street now joins it. Lloyd succeeded no better than Berlon, and in October, 1778, he went to the New Inn, whilst his waiter, Thomas Thompson, took his place, and the house was thenceforward known as Thompson's Hotel. This landlord fared better than his predecessors, for his reign lasted more

than twenty years. In 1799 the hotel was kept by James Phillips, but in October, 1813, he was overtaken by the bad fortune of former landlords, and was succeeded by Samuel Foote, from Plymouth. Foote at once proceeded to carry out several improvements, including the restoration of the large assembly-room. For decorating this in the "Egyptian style" he engaged the services of an artist named De Maria, whose work on the ceiling is described in a newspaper of the day as a masterpiece of "classic taste and elegance." The new room was opened with a ball in the following year, and in 1815 a meeting was held there to consider a plan for lighting Exeter with gas—an invention which this city was the first place in Devonshire to adopt. Samuel Foote was chiefly known to fame as the parent of Maria Foote, the celebrated actress, whose brilliant career on the stage had just commenced at the time when her father entered on the Hotel. She finally quitted the boards, in 1831, to become the wife of Charles, Earl of Harrington. The countess survived until the 27th of December, 1867. Her only son having died in his father's lifetime, the earldom passed to his uncle. Samuel Foote was succeeded by Mr. Congdon, who afterwards took the Subscription Rooms, while Mrs. Street became landlady of the Hotel. Under Foote and Congdon the house was visited by many guests of high distinction. In 1799, during Phillips' time, a great crowd assembled in front to welcome the arrival of Lord Duncan, soon after his great victory at Camperdown, and his lordship was presented with the freedom of the city. The Duke of Kent was there in 1802, and in 1806 Lord Cochrane, with his friend, Col. Johnson, set out from thence in a coach drawn by six horses, decorated with purple ribbons, to visit the electors of the immaculate borough of Honiton. In 1817 Samuel Foote received no less a guest than the Grand Duke Nicholas, afterwards Emperor of Russia. But the event which earned for the hotel its present name of *The Clarence* occurred on the 13th of July, 1827, whilst Mrs. Street was the landlady. The Duchess of Clarence, afterwards Queen Adelaide, came to Exeter on her way to join the duke, who had arrived at Plymouth by sea. Her carriage was escorted into the city by a procession, and the streets through which she passed were gaily decorated. Lord Rolle and the Recorder received the duchess at the hotel, and the bishop and cathedral dons were introduced. On the next morning she went to the Bishop's Palace and the Cathedral, and then pursued her journey to Plymouth, by way of Teignmouth and Torquay. In later years she visited

the city as the Dowager Queen Adelaide, and was again a guest at the Clarence. Mrs. Street finally let the hotel to a Mr. Graham, but it was soon afterwards sold by her executors to Mr. Birkett, whose retirement in favour of Mr. Stanbury occurred only last year.

This sketch of the Old Inns of Exeter, however imperfect, may at least suffice to prove their importance in the trade of the city, and their influence in moulding the habits of the citizens. The duty of regulating the trade in liquor was always recognized by the local as well as by the national government. In the reign of Edward IV. payments for licences to sell ale were exacted by the Corporation of Exeter, and, in the time of Henry VIII., ale-tasters were appointed to see that none but wholesome beer should be sold to the citizens. A statute of the reign of Edward VI. attempted to limit the number of taverns or wine-sellers in the principal towns of England. Exeter was allowed only four, but other places of at least equal importance, such as Norwich, Cambridge, and Canterbury, were restricted to the same number. In the reign of Charles I. the judges issued an order suppressing the multitude of unnecessary ale-houses, declaring them to be "the seminary of the greatest mischiefs within this countrey." The city authorities under the Commonwealth directed that licenses to sell ale or beer should be granted only to such persons as produced evidence of their fitness. Under the rule of Charles II., of pious memory, the justices of Devon resolved to enforce severely the laws against "all such ale-house keepers who should permit profane or lewd persons to sit tippling in their houses." In their zeal for the newly-established form of religion they ordered "that no persons shall be permitted to keep ale-houses that shall not every Sunday repair to their parish church and there abide orderly and soberly during the whole time of Divine Service, and shall not likewise produce a certificate that they have at least twice in the year last past received the Sacrament of the Lord's Supper according to the usage of the Church of England."* These and similar measures of repression failed to change the appetites of the people; and other influences, upon which it is no part of the design of this paper to dwell, are now at work with better prospect of producing a long-desired reformation.

* *Quarter Sessions under Charles II.*, by A. H. A. HAMILTON, p. 190.

MEMORANDA ON THE LUCOMBE OAK AND GOVERNOR HOLWELL.

BY WINSLOW JONES.

(Read at Totnes, July, 1880.)

It may be useful to record in the *Transactions of the Devonshire Association* that the first printed notice of this tree is contained in a letter from John Zephaniah Holwell, Esq., F.R.S., to his friend John Campbell, Esq., F.R.S., which was read before the Royal Society on the 1st of April, 1772, and was inserted in the sixty-second volume of the *Philosophical Transactions* (p. 128), which was printed in the same year.

The letter is dated Exeter, 24th February, 1772, and states that the oak was raised by Mr. William Lucombe, in his nursery at St. Thomas, near that city, about seven years previously, where he had sown "a parcel of acorns saved from a tree of his own growth of the iron or wainscot species," and that one of the seedlings had proved to be evergreen, and he concludes the letter by saying that several gentlemen round the neighbourhood, and in the adjoining counties of Cornwall and Somerset, had planted trees propagated by cuttings or grafts from the seedling in question.

The letter is also copied in Dr. A. Hunter's edition of *Evelyn's Sylva* (see fourth edition, York and London, 1812, vol. i., p. 74), and is again referred to in Loudon's *Arboretum et Fruticetum Britannicum*, London, 1838, vol. iii., p. 1851; and in the latter work it is also stated that the late Mr. Pince, the grandson of Mr. Lucombe, had informed Mr. Loudon that the iron or wainscot oak referred to by Mr. Holwell, and from which the acorns came (which is better known by the name of the Turkey oak, or the botanical name of *Quercus cerris*), had stood near a Cork tree (*Quercus suber*), and that the blossom of the Turkey oak, which was a female tree, had been impregnated by the pollen of the Cork, and that this accounted for the hybrid character of the seedling.

Mr. London does not mention the name of Mr. Holwell, and Dr. Hunter gives no indication of who he was; and it may interest the members to know that he was the chief of the unfortunate party who were confined in the celebrated "Black Hole of Calcutta" during the night of the 20th and 21st of June, 1756, and that an account of his sufferings and release, extracted from a letter which Mr. Holwell addressed to his friend Mr. Davis, will be found in the first volume of the *Annual Register* of the year 1758, which was published in 1761, and that a full account was printed in London in 1 vol. 8vo. in 1758.

A biography of Mr. Holwell will be found in Chalmers' new edition of *The General Biographical Dictionary*, London, 1814, vol. xviii., p. 89, and also in the twentieth volume of the *Biographie Universelle*, Paris, 1817, and from these biographies, and his own letter to Mr. Davis, it appears that he was born in Dublin in 1711; that he entered the service of the East India Company as a surgeon; but afterwards, at their request, abandoned his profession, and was appointed a Member of Council, and was at Fort William, in Calcutta, in June, 1756, when the Surajah Dowlah, Nabob of Bengal, attacked and took the Fort, which Mr. Holwell, on its desertion by Drake, the governor, had taken upon himself to defend. After the capture of the Fort, he, with 145 companions, was confined for about eleven hours in a prison of about 18 feet cube, and on the door being opened, a little after six in the morning of the 21st of June, 123 of the party were found to have died, and Mr. Holwell, with some of the twenty-three survivors, was afterwards sent in irons to Maxadabad, the then metropolis of Bengal, and on the 26th of July finally released.

He soon afterwards embarked for England in shattered health, but returned to India in a year or two, and in 1759 succeeded Lord Clive as Governor of Bengal; but he held this appointment for a short time only, and retired in 1761, and spent the rest of his life in England. He was the author of several works, and died at his residence at Pinner, in Middlesex, on the 5th of November, 1798, but no monument or tablet was erected to his memory.

The circumstance of the account of the Lucombe oak having been written by an eminent man while staying at Exeter, gives us some little additional interest in it; but there is also some reason to believe that Governor Holwell, though born in Dublin, was of Exeter extraction, and I have therefore gone more at length into his history than I should otherwise have done. I find from some of my father's memo-

randa that the Christian name of Zephaniah frequently appears in Exeter records in connection with the surname of Holwell. In Bishop Lamplugh's Marriage License Book, for instance, in 1683; in the Baptismal Register of St. Mary Major in 1692; in the Exeter Freeman's Admission Book of February, 1696-7; in the Baptismal Register of the Cathedral in 1724; and in the Cathedral Burial Register of 1794; and as the Christian name of Zephaniah is a very uncommon one, there would appear every probability that Governor Holwell was related to the family in which it was so often repeated.

P.S.—Since the recent meeting at Totnes, I have seen a slab in the chancel of Torbryan Church to the memory of the Rev. John Holwell, rector of that parish, who died on the 21st of January, 1730, aged 71; and this also records the death of his son *Zephaniah*, in 1720.

BLACKDOWN.

BY THE REV. W. DOWNES, B.A., F.G.S.

(Read at Totnes, July, 1880.)

A LITTLE more than eighteen years ago the writer of this paper, being about to commence a residence in Devonshire, which has continued unbroken up to the present date, was travelling westward as fast as the "Flying Dutchman" of the day could take him. In crossing the Somersetshire border of this county, and in entering Devonshire for the first time in his life, he felt, as was natural, no little interest in observing the landscape. Amongst his earliest impressions he perfectly well remembers noticing, to the eastward of the line between Taunton and Exeter, what appeared to be a railway embankment running along high ground. Though he noticed it, he did not at that time speculate at all upon the matter. His thoughts were rather directed to his journey's end. That journey's end was the parish of Staverton, in this neighbourhood, and his destination by rail (the Ashburton branch line not having then been even contemplated) was *Totnes*. He little thought that his second Devonshire parish would be that in which the sandbanks so suggestive of a railway embankment were situated, or that after the lapse of years he would be detailing the geology of "*Blackdown*" to a Totnes audience.

It will doubtless be well known to many of those who are here to-day, that no railway embankment runs along the Blackdown hills, but that the peculiar feature which is suggestive of one has been produced by the talus of refuse which has been shot out of a series of pits or galleries running horizontally into the hill. These excavations have been made by men quarrying for the whetstones, for which Blackdown still is famous. Half a century ago pits were being worked along the escarpment continuously for about a mile and a half, from Blackborough Beacon on the north, to

Upcot Pen on the south, and at intervals beyond the latter place up to and inclusive of the projecting spur, known, from the traces of an old British encampment found there, as Hembury Fort.

To this whetstone industry we are mainly indebted for our knowledge of the abundant fossil fauna of Blackdown, so wonderfully preserved in chalcedony. This industry unfortunately is a very unhealthy one, and few of those whose time has been largely given to it have lived to old age. The fine siliceous dust, like powdered glass, which flies from the chipping tool, produces, on being inhaled, an irritation of the lungs, so that (as among the needle filers of counties farther north) fine men have been frequently dying of a species of consumption almost before they have attained to middle age. The whetstone pits are now nearly exhausted, and only two or three remain open.

In other respects, a more healthy site could hardly be found. Standing upon Blackborough Beacon one may cast the eye over a landscape which ranges practically from sea to sea. The coast of the English Channel may be traced, excepting along a portion which is hidden by Woodbury Hill, from Budleigh Salterton to Babbacombe; and if the waves of the Bristol Channel be not also visible in the opposite direction, the Quantocks, and the cliffs of Watchet, alone bound the northern view. Glimpses of Exmoor are visible to the north-east, while south-westward, in the distance, the whole outline of Dartmoor is traceable. The valleys of the Exe and of the Culm occupy the foreground, immediately beyond which lies the undulating ground of the Culm-measures, with the Greensand outliers of Haldon. With such a view, and with that which the view implies, breezes as fresh as those of any cliff or moorland, with a sandy, permeable soil, and with springs of pure water gushing out at the junction of the Greensand and the red marl, we have all the conditions of a sanatorium.

Blackdown is classic ground for the geologist, whose work, therefore, largely consists in studying the literature of the subject, and in bringing together the experiences of fellow-workers in past and present times. The principal published works consulted in the present instance are as follows:

Dr. Fitton (1836), "On the Strata between the Chalk and the Oxford Oolite in the South-east of England." *Trans. Geo. Soc.*, ser. 2, vol. iv. p. 233, &c.

De la Beche, *Geological Report on Cornwall, Devon, and W. Somerset*, 1839, pp. 240-7.

De la Beche, "On the Chalk, and Sands beneath it, in the vicinity of Lyme Regis (Dorset) and Beer (Devon)." *Trans. Geo. Soc.*, ser. 2, vol. ii. p. 114.

R. A. C. Godwin-Austen (1842), "On the Geology of the South-east of Devonshire." *Trans. Geo. Soc.*, ser. 2, vol. vi. p. 433.

M. Renevier (1856), "On the Lower Greensand and Blackdown Fossils of England." *Summary Quar. Jour. Geo. Soc.*

Ed. Parfitt, "Fossil Sponge Spicules in the Greensand of Haldon and Blackdown." *Report and Transactions of the Devonshire Association*, 1870.

H. J. Carter, F.R.S., &c., "On Fossil Sponge Spicules of the Greensand compared with those of existing species." 1871.

C. J. A. Mëyer, "On the Cretaceous Rocks of Beer Head, and the adjacent cliff sections, and on the relative horizons therein of the Warminster and Blackdown fossiliferous deposits." *Quar. Jour. Geo. Soc.*, 1874.

Prof. P. Martin Duncan, F.R.S., &c., "On the Upper Greensand Coral Fauna of Haldon, Devonshire." *Quar. Jour. Geo. Soc.*, February, 1879.

In addition to the consultation of published works I have been engaged in a voluminous correspondence, and have received help or encouragement from so many quarters, either personally or by letter, that I cannot here acknowledge each separately, but I desire hereby to do so collectively.

Lithologically, the Blackdown hills may be said to consist in a descending series of

1. An impersistent capping of chalk flints in a clayey matrix.
2. Chert beds of varying thickness.
3. Greensand, containing highly fossiliferous bands with concretions, the whole being very nearly horizontally stratified. It is to this third division that the present paper mainly refers.

To the term "*Greensand*" I have been told that exception was once taken by no less an authority than the late Sir Roderick Murchison, who is reported to have said that he had only two objections to the name; firstly, that the deposits so-called were *not green*, and secondly, that they were *not sand*. But however just such a criticism may be in reference to some deposits, at Blackdown the so-called "*greensand*" is undeniably sand, except where concretionary action has produced induration. The colour certainly is variable. The prevailing shade perhaps is a pale brown, but locally it may vindicate its claim to be called green, perhaps from

a local prevalence of chloritous grains. But moisture and ferruginous bands have much to do with the variations of colour.

The physical features are those which the Greensand of the Western Counties almost invariably exhibits. Blackdown may still be called table-land, though it is deeply furrowed by streams which cut right through the Greensand to the red marl beneath. Its outline is very irregular, but the practised eye can easily trace it at the distance of many miles. From the fact that it yields to pluvial denudation far more readily than the red marl, it shows, where it caps the red marl, a steeper slope than that of the underlying deposit. There is generally also a difference in the character of the vegetation. Both these features are well exhibited in the country around Sidmouth. The observer, standing upon Salcombe Hill, may trace the line of junction at a glance, looking inland along escarpments and outliers, and then verifying his observation in the coast section below. This peculiarity of outline is rather obscured in the region of the Kentisbeare and Broadhembury whetstone pits by the talus of refuse which has been shot out of them, but it is clearly traceable again to the north at Hackpen and at Culmstock Beacon.

The recurrence of the ultimate "pen" is remarkable in this neighbourhood. Hackpen has just been mentioned. Upcot Pen was mentioned somewhat earlier in this paper. They are about three miles apart, and about midway between them is Blackborough Beacon (as it is now generally called), which is still sometimes designated by its older name of *Mortal Pen*. All three are projecting spurs, exposed situations which would never have been selected for housing flocks; and the pen is doubtless the well-known Keltic for "head."

The last of these calls for special notice here. There is an old couplet, still in circulation in the neighbourhood, which runs thus—

"When Mortal Pen Beacon sinks under the hill,
Then, I reckon, the whole of the world shall be still."

The ambiguity is worthy of a Delphic oracle; but it is to some extent unfortunate for the seer's reputation that, since he committed himself to this prophetic utterance, Mortal Pen Beacon has actually sunk under the hill, if the subsidence of the outlier to a lower level than that of the main mass be taken to be the meaning of those words of fate. What has taken place, and what the unknown prophet apparently did not reckon upon, is as follows: Two generations ago Mortal

Pen (or Blackborough Beacon) had the same altitude as the table-land adjoining it. This seems to be beyond a doubt, for from the fir trees growing on its summit lads used to survey the table-land, and I have abundant concurrent testimony that they could see from this point as far as a place called Hanger Hedge, more than a mile distant to the south-east. But Mortal Pen was found to contain whetstones. Thereupon *auri sacra fames* took possession of the industrious denizens of Ponchey Down. They made a raid upon the Beacon, and completely disembowelled it, running a tunnel right through it, and in due time a settling of the ground followed, which appears to be still going on. Moreover, not content with turning the hill inside out, they deprived it in a great measure of its external protection of heather and sward. The plough has exposed its surface, and the light sandy soil, lying as it does upon a steep slope, is yearly being washed away wholesale by pluvial denudation. The result of these two causes, but mainly of the settling of the ground in consequence of numerous pits which have been there, but of which no trace now remains, is that Mortal Pen Beacon has lost quite thirty feet of its height, and in this sense it has sunk beneath the hill, for from the tops of its fir trees nothing can now be seen even of the surface of the adjoining table-land. Whether the world is in any sense more "*still*" than it used to be is open to question.

The distant outliers of the Haldons have in general the same characters as the main deposit. Mr. Vicary, however, tells me that the higher beds at Haldon, *i.e.* the higher Greensand beds, differ both lithologically and in their fossil contents from those at Blackdown. I have not had the opportunity of examining the former *in situ*; but, through the kindness of Mr. Vicary, I have been able to see specimens both of the fossils and of matrix, and can testify to the correctness of his view. Mr. Vicary considers the fauna of these upper Haldon beds to be of Continental type. I know of no such bed at Blackdown. At the same time a very few of the characteristic fossils of that bed seem to have been found at Blackdown. There are specimens of *Spondylus striatus* (Sby.), and *Arca rotundata* (Sby.), said to be from Blackdown, in the Bristol Museum, and a very few specimens of some of the characteristic corals of the Haldon bed have been found at Blackdown also.

As to the exact *age of the beds* there has been much controversy. There can, however, be no question but that they are the basement beds of the Cretaceous system of Devon.

Mr. Mëyer, in an able paper published in the *Quar. Jour. Geo. Soc.*, has tabulated the beds stratigraphically from Blackdown up to the lower chalk of Beer.

Upper Greensand, Gault, and Lower Greensand would be all represented in the Blackdown beds, if fossil evidence could be relied upon. But for obvious reasons fossil evidence must be checked by stratigraphical observation.

I am indebted to Mr. Mëyer's paper (1874), and to private letters received from him, and from Mr. Davidson, in the autumn of last year, for much of my knowledge of the present state of the controversy.

It appears that De la Beche (*Trans. Geo. Soc.*, ser. 2, vol. ii.), 1826, and (*Ord. Survey Report*, p. 237), 1839, classified them as Upper Greensand.

Fitton, 1836 (*Trans. Geo. Soc.*, ser. 2, vol. iv. p. 233), made them Lower Greensand.

Godwin-Austen, 1842 (*Trans. Geo. Soc.*, ser. 2, vol. vi. p. 449), described them as possibly a sandy condition of the Gault.

In 1863 (*Geologist*, vol. vi. p. 50), and again in 1866 (*Geo. Mag.*, vol. iii. p. 13), Mr. Mëyer, partly on palæontological, and partly on stratigraphical evidence, attempted to show that they were Lower Greensand, but he has since, to some extent, changed his opinion.

Mr. Etheridge, mainly on the evidence of the Black Ven section, near Lyme Regis, places them on the horizon of the Gault; and to this Mr. Mëyer, writing in 1874, is almost prepared to agree; but he still thinks that some part may be of Lower Greensand age.* He says:

"True Gault . . . is to be seen near Punfield, in Swanage Bay, where it is underlain by a considerable thickness of Lower Greensand. It is traceable as Gault along the coastline as far westward as Mewps Bay. At Lulworth Cove it is to be seen no longer as Gault, which in its argillaceous condition has either thinned out, or given place to dark greenish sandy strata, with zones of large concretionary nodules.

"These beds contain Gault fossils in abundance, and (what is well worthy of notice) pass insensibly into Upper Greensand, and downwards into ferruginous sands of Lower Greensand.

"In the altered condition of the Gault, as present at Lulworth, one finds therefore an approach already to the condition of the so-called Gault, as seen at Black Ven. And there is *no doubt whatever*† that Gault in such condition is present both at Black Ven, and in the sections to the westward. But is this all? I think it

* *Quar. Jour. Geo. Soc.*

† The italics are mine.

possible that Lower Greensand, which, as we have seen at Lulworth, actually accompanies the Gault to its extinction as a clay bed, *may* form a part also of the still doubtful strata to the westward. As to the correctness of this supposition it is only fair to say that I have no evidence whatever.*

In the same paper Mr. Meyer, commenting upon a paper by Mr. Ralph Tate† (who thinks that the Irish and Devonshire Greensand deposits were once continuous), gives it as his opinion‡ that the "Glauconite Sands" of Ireland probably correspond with the Blackdown beds.

For a further and later expression of opinion by Mr. Meyer, I am indebted to a private letter, written by him to Mr. Davidson, F.R.S., and forwarded by the latter to me. In October, 1879, Mr. Meyer writes as follows:

"The present prevalent opinion respecting the age of the Blackdown Greensand is that it represents most nearly the Upper Greensand. Barrois (*An. de la Soc. Geo. du Nord*, t. iii. p. 1, 1878,) places the Blackdown beds unhesitatingly in the lower part of the Upper Greensand, in his zone of *Am. inflatus*. Price, I fancy, supposes it to represent Upper Gault. MM. Briart and Cornet (*Mém. Cour. de l'Académie R. de Belgique*, t. xxxiv., 1870) correlate the Blackdown Greensand with the so-called 'Meule de Bracquignies.'

"For my part I still believe the Blackdown Greensand to represent a littoral deposit of more than one age or period, ranging possibly from the highest beds of the Lower Greensand to the lower beds of the Upper Greensand inclusive.

"The fossils of the 'Meule de Bracquignies,' so many of which are referred by MM. Cornet and Briart to Blackdown species, differ in such points as bring them nearer to the Chloritic Marl fauna, and they are moreover associated with Chloritic Marl species; and for this reason I fancy our Blackdown fossils are older than their supposed Belgian equivalents."

To sum this all up, it would appear that we owe it to De la Beche that our Blackdown beds are coloured as Upper Greensand in the Ordnance Map, and that while several Continental geologists still hold in the main De la Beche's view, Mr. Etheridge and Mr. Meyer, adopting in general the opinion of Mr. Godwin-Austen, consider them to be mainly of Gault age, but to include also perhaps some parts both of the Upper and of the Lower Greensand, and more especially of the latter.

* MEYER, p. 382.

† *Quar. Jour. Geo. Soc.*, vol. xxi. p. 15.

‡ MEYER, pp. 384, 385.

A good deal of confusion in regard to the Blackdown fauna has arisen through the mingling together in collections of specimens from other Greensand localities with Blackdown fossils; and not only so, but by the omission on the part of many, and especially the older collectors, of any attempt to restrict the term "Blackdown beds" to the basement beds of the series. The compilation therefore of a correct catalogue of Blackdown fossils is no easy matter. It is impossible in every case to verify the localities, and it would be unreasonable to reject every specimen whose locality cannot now be verified. But as the chalk marl and chloritic marl of the south-east of England are, the one necessarily, and the other generally, calcareous, and as Greensand beds in other parts of England are frequently calcareous, one is enabled with certainty to reject a good many which have no right to a place on the list. No true Blackdown fossil is calcareous.

As a proof of the necessity of such caution, I may mention that I have found calcareous fossils labelled as "Blackdown" in at least three provincial museums, and in more than one private collection.

Another difficulty which besets the enquirer is the determination of the zones, or subdivisions of the beds, and the appropriation to each of its characteristic fossils. I believe that success in such a work at the present time can be but partial.

Dr. Fitton estimated the thickness of the whole Cretaceous series at the whetstone pits at 100 feet. I am not singular in thinking this estimate excessive. I should have said that it did not exceed 70 feet. This estimate includes the superficial flint beds. Intermixed with these and with the chert, are a great number of iron concretions, and I take the opportunity of mentioning, parenthetically, in regard to those latter, that they were formerly collected and taken away to iron foundries. Mr. P. O. Hutchinson has a paper upon the "Iron Pits" found in this locality, which was published in *Trans. Devon. Assoc.* in 1872. It is curious that concretions somewhat similar in character are scattered over the Trias of the neighbourhood, but with this difference, that whereas those on Blackdown are generally pure; those associated with the Trias are filled with Triassic and Cretaceous material, so as to form a conglomerate. At the base of the Blackdown beds at the whetstone pits I have everywhere found about 20 feet of homogeneous rusty-coloured rocksand, without a trace, so far as I am aware, of anything organic in it. Between this rocksand and the chert lie the fossiliferous beds quarried for

whetstones, perhaps about 25 feet thick, thus leaving about another 25 feet for the chert and flint.

Dr. Fitton divides these middle beds as follows :*

1. Reddish sandrock.
2. "Fine vein." Concretions of firm consistence, used for scythe-stones. 2 inches to 1 foot.
3. "Top sandrock." Sand, with irregular concretions; of no use. 3 feet to 4 feet.
4. "Gutters." Concretions of stone in four or five courses in the sand. This bed is that most commonly used for scythe-stones. 3 feet to 5 feet.
5. "Burrows." Stone and sand of the same kind, but used only for building. 2 feet to 3 feet.
6. "Bottom Stones." A range of concretions, affording excellent scythe-stones. 2 inches to 6 inches; sometimes as much as 5 feet.
7. "Rocksand." Chiefly sand with fewer concretions; of no use. 4 feet.
8. "Soft vein." Concretions which afforded excellent scythe-stones. 2 inches to 6 inches.

Of the general correctness of this description there can be no question, and as the opportunities of observation in Dr. Fitton's day were infinitely better than they are now, I prefer to give his section as it stands to attempting to make a fresh one. I will add only my own comments.

It is evident that the thickness of these subdivisions varies locally. In a pit now open I found bed 5 about 1 foot thick, and bed 7 was from 6 feet to 7 feet. Above the beds described by Dr. Fitton, and indeed above the level usually quarried, another fossiliferous bed, worthy of special mention, has been pointed out to me by a workman.

I am not aware that any attempt has hitherto been made to assign the several fossils to the several zones, or at least that there exists any record of such attempt. Clearly it might have been done many years ago far better than now; but the process of collecting Blackdown fossils has always been an unsatisfactory one. That process is somewhat as follows:

As an almost universal rule, and perhaps unavoidably so, collectors, instead of getting their fossils *in situ*, have bought them from the quarrymen. A quarryman drives out a barrow full of refuse, and on coming to the light, finds that there are

* FITTON, pp. 236-7.

fossils in sufficient number and in sufficiently good preservation to repay him for putting them aside. He thrusts them into his coat-pocket, breeches pocket, dinner-basket, or any available place of temporary security. Thence, on getting home, he transfers them to the pig's bucket, or old hat, or whatever is the recognised repertorium of *recherché* articles. Before, however, the collector or his agent reaches the scene, the lucky quarryman has perhaps had another find from a different zone, perhaps from another pit in another part of the hill. The half-filled pig's bucket is now filled to the brim. All the old hats in the house are in requisition, and bonnets too. In due time the collector arrives, and all the precious hoard is poured promiscuously into his portmanteau. Then the collector goes home happy, and so does the quarryman.

M. Renevier, alluding to the fact that the Blackdown beds contain a mixed fauna of Upper Greensand, Gault, and Lower Greensand forms, adds: "There is no doubt whatever of the mingling of these species, and of their occurrence in the same deposit."* As we have seen, there can be no doubt whatever but that they are thoroughly well mingled before they reach most cabinets. But more than this may be said; nor is this apparently what M. Renevier means. He means, I think (and my own observations confirm to some extent what he says), that the fossils are not always found in the order of palæontological succession which might have been expected. So far as my own limited observations go, there are some very distinct zones; and it would seem that in the higher fossiliferous zones we have chiefly Gault forms intermixed with a smaller proportion of an Upper Greensand facies, while in the lowest fossiliferous bed with which I am acquainted, viz., bed 6, we have only three characteristic species, two of which are elsewhere found in Lower Greensand; while the third † is, I believe, a variety peculiar to Blackdown.

The highest fossiliferous bed in the Greensand is above those recorded by Fitton, and is not mentioned by him. It consists of 2ft. or 3ft. of greenish-grey loose stratified sand, containing a thin band, not everywhere persistent, of fossil shells, for the most part broken, and all of them waterworn. When whole they are always single valves. The most abundant form is *Pectunculus sublævis* (Sby.), but almost as abundant is *Trigonia excentrica* (Sby.) This is remarkable, for I cannot find that *T. excentrica* occurs in any other zone, so that the zone would deserve the name of the *T.*

* *Quart. Journ. Geo. Soc.*, 1856.

† *Trigonia scabricola* (Lycett).

excentrica zone. With these I found in lesser numbers *Cardium Hillanum* (Sby.), a *Cytherea*, *Astarte formosa* (Sby.), *Nucula obtusa* (Sby.). These I myself extracted from the bed *in situ*.

For the contents of the beds beneath this, I am obliged to rely in part upon the testimony of the workmen; but I am satisfied as to the following:

Bed 1, of Fitton, contains, I believe, *Natica gaultina* (D'Orb.), *Cyprina cuneata* (Sby.), *Cardium proboscidium* (Sby.), *Trigonia spectabilis* (Lycett).

Bed 3, which is the main fossiliferous bed, contains *Turritella granulata* (Sby.) in dense clusters and in large numbers, and *Pectunculus umbonatus* (Sby.), in numbers nearly as large; *Dimorphosoma* (*Aporrhais*) *Calcarata* (J. S. Gardner), *D. neglecta* (J. S. Gardner), both in large numbers; *Murex calcar* (Sby.), frequent; *Inoceramus concentricus* (Park), *Cytherea caperata* (Sby.), *Actæon affinis* (Sby.), *Cucullæa glabra* (Sby.), and *C. carinata* (Sby.), *Corbula elegans* (Sby.), *Siphonia pyriformis* (Goldf.). Associated with these are often found myriads of *pisolitic concretions*, about which conjecture has been busy, but which cannot, except by mere conjecture, be attributed to anything organic. *Cardium Hillanum* (Sby.), and *Natica gaultina* (D'Orb.), are also found here as well as in bed 1. Doubtless, the list of fossils from this and other beds might be greatly augmented, but I give those only of which I have tolerably certain evidence. The condition of the fossils in this bed is a great contrast to that of those first named. They have evidently been deposited in still water in or very near to their habitat. Bivalves are generally found with both valves in natural apposition. The signs of attrition are absent. Few, if any, are broken. *Murex calcar*, with its long slender spines, is frequently found quite perfect. And long univalves, like *Turritella granulata*, are found inclined at all angles to the bedding.

Bed 6 contains *Grevillia anceps* (Desh.), *Trigonia alæformis* (Park), and *T. scabricola* (Lycett).

As a rule, very few fossils are found in the concretions, though a thin sandy partition between the concretions may be crowded with them. There are, however, not unfrequent exceptions; and the *Asteroidea*, of which I have seen six specimens, are all in the hearts of half-shaped scythe stones.

A pit now being worked runs about 250 yards into the hill, and I have more than once examined it. The strata appear to be very nearly horizontal. The dip is something like $1\frac{1}{4}^{\circ}$ E. for the first half of the distance, and about $1\frac{1}{2}^{\circ}$ W.

the remainder of the distance. In other words, there is a gradient of about 1 in 65, first in the one direction and then in the other. I could see no trace of a fault; but from descriptions given me of the pits in Hembury Fort, I conclude that the latter is faulted.

It used to be a matter of wonder to me that, according to the universal testimony of the workmen, nearly all the fossils have been obtained near to the entrances of the pits. This, however, seems to be accounted for by a terminal curvature. The upper fossiliferous beds are thus necessarily traversed first. After this the excavations are almost always made beneath them, because the beds most productive of scythestones lie lower down in the series.

Mr. Meyer mentions a bed of a "greenish sandy argillaceous" character, which he says is "a well-nigh universal base-bed,"* occurring both at Ponchey Down and in the coast section. Mr. H. B. Woodward also mentions its occurrence near Honiton.†

Dr. Fitton, on the other hand, says: "Between the sand and the Red Marl beneath it I did not observe . . . any indications of an intermediate bed of clay."‡

This is conflicting. My own experience in regard to Ponchey Down agrees with that of Dr. Fitton. I can find nowhere at the whetstone pits any Cretaceous clay-bed at the base. On the contrary, in pits at a low level, and in cellars excavated at the backs of the cottages, I have found everywhere in this locality as a base bed the homogeneous rocksand above mentioned. It may doubtless be different at Honiton. I have seen the beds described by Mr. Meyer, in the coast section.

I have quoted near the commencement of this paper, among the literature of the subject, the valuable contributions of Mr. Parfitt, and of Dr. H. J. Carter, on the sponge spicules. I cannot say that I have studied this branch of the subject otherwise than by reading these two interesting papers. Mr. Vicary tells me that there is a distinct and thin spiculiferous zone at Haldon. At Blackdown I have long been aware that the spicules pervade the whole deposit. Dr. Carter speaks of "a stratum *twenty-five feet thick*, which is almost entirely composed of grains of sand and the spicular remains of various sponges,"§ and he is well within the mark. In some loam, which I sent in May last to Mr. Moore, of Bath, and which was taken from above my "*Trigonia*

* p. 371.

† *Geology of England and Wales*, p. 237.

‡ p. 238.

§ p. 116.

excentrica band," the latter found "only sponge spicules." Higher still, the chert seems often to be full of them, as is well seen in some weathered fragments. Possibly, just as corals are found in much greater abundance at Haldon than at Blackdown, so the reverse may be the case with sponges, and their development may have increased eastward. It is, I believe, a fact, that the curious sponge, *Siphonia pyriformis* (Goldf.), so common at Blackdown, has not been found at Haldon. It is interesting to read that the sponge spicules of the Greensand are believed to be in several instances identical with those of some existing species.

I append a list of fossils found at Blackdown, some of which are found also at Haldon. I have laboured to make the list as complete and trustworthy as possible, but it should be remembered that I have had in many cases to deal with collections in which some manifestly misquoted specimens discredit, to some extent, the localities of the remainder. It is apt to be assumed that, after the calcareous fossils have been rejected in a collection, the siliceous remainder would be reliable. But this is not at all necessarily the case. Fossils out of chalk flints would be siliceous, and those from the chloritic marl do not always effervesce, and in the older collections these were not generally separated from those of the lower horizons. In the subjoined list it is only in a very few instances that I have any reason to question the localities, and in those instances I have made a note to that effect. And in all cases, except those of the commonest species, I have given my authorities.

PLANTÆ.

A curious fern-like impression. Collection of Mr. Vicary. Wood, silicified and (frequently) bored by *Teredo*.

SPONGIDA.

Siphonia pyriformis (Goldf.), very common at Blackdown. I cannot hear of any specimen from Haldon.
Spicula, distributed throughout the beds.

ACTINOZOA.

Astrocænia decaphylla (E. and H.) I have one small specimen from Blackdown. In the higher beds at Haldon it is by no means uncommon.

? *Isastræa*. I have one small and rather doubtful specimen.

? *Holocystis*. Albert Memorial Museum, Exeter.

Coral (unnamed). Albert Memorial Museum.

Smilotrochus ? Austeni (E. and H.) One young specimen in the collection of the late Mr. Fox, of Wellington. Mr. Vicary has several from Haldon. [Two more specimens of apparently the same coral have been found at Blackdown since this paper was read.]

ECHINODERMATA.

Comatula. Jermyn Street Museum.

Goniaster Comptoni (Forbes). Jermyn Street Museum.

G. elegans (Gray). Jermyn Street Museum.

Marginal ossicles, apparently of some species of *Goniaster*, are frequently found in the loose sandy strata.

Salenia. New specimen. Jermyn Street Museum.

Echinobrissus Morrisii (Forbes). Jermyn Street Museum.

Cardiaster Perizii [bisulcatus, Gras.] (Sism.) Jermyn Street Museum.

Hemipneustes Greenovii (Forbes). Jermyn Street Museum.

Hemiaster Murchisoniae (Mant.) Jermyn Street Museum.

† *Glenotremites*, plates of. Collection of Mr. Vicary.

Pygurus lampas (De la Beche). Albert Memorial Museum, Exeter.

Pseudodiadema ornatum (Goldf.) Albert Memorial Museum.

† *Astropecten*. Two specimens of *Asteroidea* are in the Bristol Museum, and four in the Taunton Museum. All are in the midst of concretions half cut into scythe-stones.

ANNELIDA.

Serpula filiformis (Sby.) Common.

S. antiquata (Sby.) Bristol Museum.

S. plexus (Sby.) Bristol and Jermyn Street Museums.

S. vermes. Bristol Museum.

S. tuba (Sby.) Bristol Museum.

S. carinella. Bristol Museum.

Vermicularia concava (Sby.) Common.

V. radiata (Sby.) Bristol and Albert Memorial Museums.

V. umbonata (Sby.) Bristol Museum.

Vermilia ampullacea (Sby.) Bristol and Jermyn Street Museums.

CRUSTACEA.

Pollicipes lævis (Sby.) Collection of Mr. Vicary.

POLYZOA.

Polyzoa are met with on Haldon in greater numbers and variety than at Blackdown. Two or three species from Blackdown are met with in most collections, but their affinities appear at present to be little known. It is singular that at Jermyn Street seventeen specimens (all unnamed) are referred to Blackdown, and none to Haldon. At the Bristol Museum the three following are named.

Heteropora dichotoma ?

H. cryptopora (Goldf.)

Ceriopora gracilis (Goldf.)

BRACHIOPODA.

Rhynchonella depressa (Dav.) Collection of Mr. Walrond, of Dulford House, near Collumpton. Two specimens, which were sent by me to Mr. Davidson for determination.

R. latissima (Sby.) Bristol Museum. At Jermyn Street there is a specimen of this from Haldon.

R. ? species. Woodwardian Museum, Cambridge.

Mr. Davidson, in his supplement to the British cretaceous Brachiopoda, p. 32, in reference to a *Terebratula ovata* (Sby.), reputed to have come from Blackdown, says, "A young specimen in the Cambridge Woodwardian Museum, is stated to have been obtained from the Greensand of Blackdown, which beds are considered by Renevier, Etheridge, and others to be an equivalent of the Lower Greensand or Gault, especially of the upper part of the last-named formation. Brachiopoda are exceedingly rare at Blackdown. I have never seen or heard of more than this specimen, and two or three of a *Rhynchonella*."

As I happened to know that *T. ovata* is one of the characteristic fossils of the Chloritic Marl and Warminster beds, I thought it worth special enquiry. I therefore wrote to Mr. Tawney, requesting him to test the specimen with acid. He kindly did so, and reported to me that it was *calcareous*, and he added that it did not "look right for Blackdown," nor could anyone now about the museum give any account of the specimen. He suggested Farringdon as its possible locality. One thing is certain. It did not come from Blackdown.

Mr. Davidson's *Supplement* was in print some years before I sent to him the two specimens of *Rh. depressa* above mentioned. These I myself extracted last year from undoubted Blackdown matrix. Mr. Davidson tells me that they are Lower Greensand species; and he adds, "It is rather singular that Brachiopoda are so very rare in the Blackdown beds, since you have got two authentic specimens. Usually where Brachiopoda occur they are plentiful." Mr. Vicary has several specimens (two species) of *Rhynchonella* from Haldon, but none from Blackdown.

LAMELLIBRANCHIATA.

Ostrea frons (Park.) = *O. carinata* (Sby.) Jermyn Street and Bristol Museums. My own collection. Mr. Vicary has specimens from Haldon.

O. macroptera (Sby.) Bristol Museum.

O. ? species. Albert Memorial Museum, Exeter.

Ecogyra conica (Sby.) Very common both at Blackdown and at Haldon.

E. undata. Bristol Museum.

E. plicata (Lam.) Jermyn Street. Blackdown and Haldon.

Hinnites (species ?) Jermyn Street.

- Pecten Milleri* (Sby.) Jermyn Street and Bristol Museums, and in most collections. Found also at Haldon. Fig. by Fitton. Pl. xvii. f. 19.
- P. quadricostatus* (Sby.) = *Janira quadricostata*. Common at Blackdown and Haldon. In the former locality I have found it *in situ* above the whetstone beds. It appears to be found only high up in the series.
- P. quinquecostatus* (Sby.) = *Janira quinquecostata*. Jermyn Street, Bristol, and Albert Memorial Museums.
- P. asper* (Lam.) Non-calcareous specimens, claiming to come from Blackdown, are at the Bristol and Taunton Museums. I have seen also calcareous specimens, reputed (and of course erroneously) to have come from Blackdown. The locality of the siliceous specimens cannot be disproved, but I am inclined to question it.
- P. orbicularis* (Sby.) Bristol and Albert Memorial Museums.
- P. species ?* Bristol Museum.
- P. elongatus* (Lam.) = *P. obliquus* (Sby.) Bristol Museum.
- P. compositus* (Sby.) Bristol Museum. Fitton, pl. xvii. f. 20.
- P. stuchburyanus* (Sby.) Bristol Museum. Fitton, pl. xviii. f. 1.
- Lima semisulcata* (Sby.) Jermyn Street, and Bristol Museums. Also found at Haldon. Fitton, pl. xvii. f. 10.
- L. subovalis* (Sby.) Bristol Museum. Fitton, pl. xvii. f. 21.
- L. ? morenna* (D'Orb.) Mr. Vicary's collection.
- Spondylus striatus* (Sby.) Bristol Museum. Mr. Vicary has a specimen of the same from the upper beds at Haldon.
- Avicula anomala* (Sby.) Jermyn Street, and Bristol Museums. Mr. Vicary's collection. Blackdown and Haldon. Fig. by Fitton. Pl. xvii. f. 18.
- Grevillia anceps* (Desh.) Common at Blackdown; found also at Haldon.
- G. solenoides* (Def.) Jermyn Street Museum.
- G. rostrata* (Sby.) Jermyn Street and Bristol Museums. Mr. Walrond's collection and my own. Found at Blackdown and Haldon = *Perna rostrata*, Albert Memorial Museum; also = *Avicula lanceolata* (Forbes), Mr. Vicary's collection. Fig. by Fitton. Pl. xvii. f. 17.
- Perna ?* Fragment of large form. Albert Memorial Museum.
- Inoceramus concentricus* (Park.) Common at Blackdown.
- I. sulcatus* (Park.) Common at Blackdown.
- Pinna tetragona* (Sby.) Jermyn Street and Bristol Museums. Mr. Walrond's collection. Mr. Vicary has a fragment of some species of *Pinna* from Haldon.
- Mytilus striatocostatus* (D'Orb.) Jermyn Street Museum.
- M. tridens* (Sby.) Most collections. Found also at Haldon. Fig. by Fitton. Pl. xvii. f. 14.
- M. ? species.* Jermyn Street Museum.
- M. praelongus* (Sby.) Bristol Museum. Fig. by Fitton. Pl. xvii. f. 15.

M. inaequalvis (Sby.) Bristol Museum. Fig. by Fitton.
Pl. xvii. f. 16.

Modiola aequalis (Sby.) Jermyn Street Museum.

M. Lygeriensis ? (Sby.) Jermyn Street Museum.

M. ? species. Bristol Museum.

M. reversa (Sby.) Common at Blackdown ; found also at Haldon.
Fig. by Fitton. Pl. xvii. f. 13.

Arca (species ?) Jermyn Street Museum.

A. rotundata (Sby.) Bristol Museum. Mr. Vicary has specimens
of this from the upper beds at Haldon. Fig. by Fitton.
Pl. xvii. f. 8.

Limopsis (species ?) Bristol Museum. Mr. Walrond's collection.

Cucullæa carinata = *C. costellata* (Sby.) Common at Blackdown ;
found also at Haldon.

C. fibrosa (Sby.) } Common both at Blackdown and Haldon. If
C. glabra (Park.) } there are two species they may be distinguished
as their names suggest. The one is glabrous, and the other
is fibrous ; but, as Mr. Sowerby remarks (*Min. Con.*, vol. iii.
p. 9), "the smoothness of the surface may arise from wear."
In shape they are indistinguishable. Mr. Vicary has shown
me an existing species scarcely distinguishable from the fibrous
variety.

C. formosa (Sby.) Bristol Museum. Fig. by Fitton. Pl. xvii.
f. 7.

Pectunculus sublævis (Sby.) } Here again is a specific distinction
P. umbonatus (Sby.) } not always admitted. At Blackdown
the smoother variety appears to come from the highest bed,
that of broken triturated shells with separated valves, so that
the smoothness might be supposed to be the result of attrition
only. But there it is associated with *Trigonia excentrica*,
whereas the more clearly striated variety is principally found
in bed 3, where *Trig. excentrica* never occurs, and in which
Pectunculus is almost always found with the valves in natural
opposition. Both are very common at Blackdown, but at
Haldon *P. sublævis* is found rarely, and *P. umbonatus*, so far
as I can learn, not at all. They are specifically distinguished
at the Jermyn Street Museum.

P. (species ?) Jermyn Street Museum.

Nucula antiquata (Sby.) = *N. apiculata*. Common at Black-
down.

N. impressa (Sby.) Bristol Museum.

N. obtusa (Sby.) Common at Blackdown ; found at Haldon. Fig.
by Fitton. Pl. xvii. f. 11.

Leda lineata (Sby.) = *Nucula lineata*. Common at Blackdown ;
found at Haldon. Fig. by Fitton. Pl. xvii. f. 9.

Trigonia alæformis (Park.) Common in bed 6 only at Black-
down ; found at Haldon.

T. scabricola (Lycett). Very nearly akin to the above, and found

- associated with it both at Blackdown, where it is common, and at Haldon.
- T. dædalea* (Park.) Rare at Blackdown; but more common at Haldon. It appears to occur high up in the series.
- T. excentrica* (Sby.) At Blackdown peculiar to the highest bed; viz., that above bed No. 1 of Fitton; found also at Haldon.
- T. spectabilis* (Lycett). Peculiar to bed No. 1 of Fitton at Blackdown. There is a specimen from Haldon at Jermyn Street.
- T. spinosa* (Park.) A rather rare species. There are specimens at the Jermyn Street, Bristol, and Albert Memorial Museums, and in the collections of Mr. Vicary, and of the late Mr. Fox. Dr. Lycett, in his "Monograph on Fossil Trigonizæ" (*Pub. of Pal. Soc.*, vol. xxii.) has figured Mr. Vicary's specimen.
- T. quadrata* (Sby.) Bristol Museum. Fig. by Fitton. Pl. xvii. f. 12.
- T.* (species ?) Jermyn Street Museum.
- T. sinuata* (Park.) Bristol Museum, and ? Mr. Walrond's collection.
- T. læviuscula* (Lycett) = *T. Coquandiana* (D'Orb.) Figured by Dr. Lycett, from a specimen belonging to Mr. Vicary; "Monograph on Fossil Trigonizæ" (*Pal. Soc.*, vol. xxii. f. 6.
- Cardium Hillanum* (Sby.) Common.
- C. subhillanum* (Leym.) Jermyn Street Museum.
- C. proboscidium* (Sby.) Not uncommon at Blackdown; very rare at Haldon.
- Lucina orbicularis* (Sby.) Common at Blackdown; found at Haldon. Fig. by Fitton. Pl. xvi. f. 13.
- L. pisum* (Sby.) Jermyn Street, Bristol, and Albert Memorial Museums. Fig. by Fitton. Pl. xvi. f. 14.
- L.* (species ?) Jermyn Street Museum.
- Cyprina angulata* (Flem.) Common both at Blackdown and at Haldon.
- C. cuneata* (Sby.) Common both at Blackdown and at Haldon.
- C. rostrata* (Sby.) Common at Blackdown. Fig. by Fitton. Pl. xvii. f. 1.
- Astarte formosa* (Sby.) Common.
- A. concinna* (Sby.) Bristol Museum. Fig. by Fitton. Pl. xvi. f. 15.
- A. obovata* (Sby.) Blackdown and Haldon. Jermyn Street Museum, and Mr. Vicary's collection.
- A. striata* (Sby.) Jermyn Street and Bristol Museums, and Mr. Vicary's collection.
- A. impolita* (Sby.) Bristol Museum. Fitton, pl. xvi. f. 18.
- A. cuneata* } Are mentioned by Fitton, who figures the last
- A. lineata* } (pl. xvi. 17), but I cannot find them in any
- A. multistriata* } collection.
- Venus sublævis* (Sby.) Common at Blackdown; found also at Haldon. Fitton, pl. xvii. f. 5.

- V. submersa* (Sby.) Jermyn Street Museum, and Mr. Vicary's collection. Fitton, pl. xvii. f. 4.
- V. faba* (Sby.) Bristol Museum, and Mr. Vicary's collection.
- V. immersa* (Sby.) Bristol Museum, and Mr. Vicary's collection.
- V. truncata* = *Cytherea truncata* (Sby.) Jermyn Street, Bristol, and Albert Memorial Museums. Fitton, pl. xvii. f. 3.
- Cytherea caperata* (Sby.) Common both at Blackdown and Haldon.
- C. lineolata* (Sby.) Most collections.
- C. plana* (Sby.) Common. Found at Haldon.
- C. subrotunda* (Sby.) Jermyn Street and Bristol Museums.
- C. (venus) ovalis* (Sby.) Bristol Museum. An interesting specimen showing the colour bands.
- Petricola* ? *canaliculata* (Sby.) Fitton, pl. xvi. f. 11.
- P. nuciformis*. Fitton, pl. xvi. f. 10.
- Maetra angulata* (Sby.) Jermyn Street, and Bristol Museums. Fitton, pl. xvi. f. 9.
- Tellina inæqualis* (Sby.) Common. Found at Haldon.
- T. striatula* (Sby.) Common. Found at Haldon.
- Psammobia*. Jermyn Street ? and Bristol Museums.
- Capea elegans* (D'Orb.) A new species. Collection of Mr. Vicary.
- Mya lævinscula* (Sby.) Bristol Museum, and Mr. Vicary's collection. Fitton, pl. xvi. f. 6.
- Goniomya*. Bristol Museum.
- Corbula elegans* (Sby.) Common.
- C. truncata* (Sby.) Jermyn Street and Bristol Museums. Fitton, pl. xvi. f. 8.
- C. striatula* (Sby.) Woodwardian Museum, Cambridge.
- Thetis gigantea* (Sby.) Common. Found at Haldon.
- T. gigantea*. Spinous variety ? Sowerby (*Min. Con.*) gives one figure with spines and two without them. I have examined many specimens, and have always found them to be either decidedly spiniferous or decidedly non-spiniferous. Some worn specimens show clear traces of the roots of spines, and in other cases there is no vestige of a spine in specimens which have not suffered from attrition. The traces of the spines remain even in specimens in which the characteristic striae are almost obliterated. The best preserved specimen which I have seen is one belonging to Mr. Walrond. There is a worn specimen in the Albert Memorial Museum. Is there a distinct variety, or do the spines mark a stage of growth ?
- Thetis Sowerbyi* (Röm.) Jermyn Street Museum.
- Thetis major* } ? = the above. Common. They are thus distinguished by Sowerby (*Min. Con.*), who, however, admits that the distinction is mainly one of size.
- T. minor* }
- Myacites* (species ?) Jermyn Street Museum. Collections of Mr. Walrond and of myself.

- M. plicatus* (Sby.) Bristol Museum.
M. ovalis (Sby.) Bristol Museum. Fitton, pl. xvi. f. 5.
Pholadidia (species ?) Jermyn Street Museum.
Periploma (species ?) Jermyn Street Museum.
Teredo (boring in wood). Common.

GASTEROPODA.

- Murex calcar* (Sby.) Common.
Pyrula (species ?) Jermyn Street Museum.
P. depressa (Sby.) Bristol Museum. Collection of Mr. Walrond. *
 Fitton, pl. xviii. f. 20.
Fusus rigidus (Sby.) Jermyn Street ? and Bristol Museums. Collections of Mr. Vicary, and the late Mr. Fox. Fitton, pl. xviii. f. 16.
F. rusticus (Sby.) Bristol Museum. Fitton, pl. xviii. f. 18.
F. quadratus. Bristol Museum, and collection of Mr. Vicary. Fitton, pl. xviii. f. 17.
F. clatheratus (Sby.) Bristol Museum, and collection of Mr. Vicary.
F. new species. Bristol Museum. There are two undetermined species of *Fusus* in the collection of the late Mr. Fox.
Nassa costellata (Sby.) Jermyn Street and Bristol Museums. Collections of Mr. Champernowne, of the late Mr. Fox, and of myself. Fitton, pl. xviii. f. 26.
N. lineata (Sby.) Collections of Mr. Champernowne, of the late Mr. Fox,* and of Mr. Walrond. Fitton, pl. xviii. f. 25. This species, as pointed out to me by Mr. Sollas, very closely resembles the existing species, *N. reticosa*, found off the Philippine Islands at a depth of 6 fathoms, a very similar habitat probably to the Blackdown sea.
Natica gaultina (D'Orb.) Common. Found at Haldon. ? = *N. canrena* (Park.) ? = *N. canaliculata* (Sby.) Fitton, pl. xviii. f. 6.
N. new species. Collection of Mr. Walrond.
N. granosa (Sby.) Fitton, pl. xviii. f. 7.
Fossarus carinatus = *Natica carinata* (Sby.) Fitton, pl. xviii. f. 8. Bristol Museum. Collection of the late Mr. Fox. *
Cerithium (species ?) Jermyn Street and Albert Memorial Museums.
C. gracile = *Littorina gracilis* (Sby.) Fitton, pl. xviii. f. 12. Collection of the late Mr. Fox. *
 (A) *Tessarolax retusa* (Sby.) = *Rostellaria retusa* (Sby.) Bristol Museum. Fitton, pl. xviii. f. 22.
 (B) *Aporrhais Parkinsoni* (Mant.) = *Rostellaria Parkinsoni* (Sby.) Common at Blackdown; found also at Haldon. Fitton, pl. xviii. f. 24.
 (C) *Dimorphosoma calcarata* (Sby.) = *Rostellaria calcarata* = *Aporrhais calcarata*. Very common at Blackdown.

* Named by Dr. Woodward.

- (D) *Dimorphosoma neglecta* (Tate). Figured in the *Geological Magazine*, 1875, pl. xii. fgs. 13-15. Common.
 (E) *Pterocella macrostoma* (Sby.) = *Rostellaria macrostoma* (Sby.)
 Bristol Museum. Fitton, pl. xviii. f. 23.

In the case of the five preceding (viz., A to E inclusive), the classification of Mr. J. Starkie Gardner has been followed, who unites them in one family, *Aporrhaidæ* (Gray). (*Geological Magazine*, February, 1880.) The following remarks also may not be out of place. At Jermyn Street the generic name "*Rostellaria*" has been erased for specimens of B and C, and "*Aporrhais*" substituted. Mr. R. Tate has, I believe, written "On the so-called *Rostellariæ* of the Cretaceous Rocks," and refers to the Blackdown species. (*Geological and Natural History Repertory*, vol. i. pp. 92, 93. 1865.)*

Professor A. Nicholson (*Manual of Palæontology*, 1st Edition, p. 252) says: "A great many Jurassic and Cretaceous shells, generally referred at present to *Rostellaria*, probably belong to *Aporrhais*."

Mr. J. Starkie Gardner, in the *Geological Magazine*, 1875, p. 398, in an article on "Cretaceous *Aporrhaidæ*," under the head of "*Dimorphosoma calcarata*," says: "Mr. Meyer informs me that this shell is about five times more numerous than that next described (*D. neglecta*), with which it is found associated. It is just possible that this may be the male, and *D. neglecta* the female, as in *Fusus*, an allied family. Mr. Gwyn Jeffreys remarks: 'Of many hundreds of specimens which I have examined the males were more numerous than the females.'

"*D. neglecta* (p. 399). It is found at Blackdown, where it is less common than *D. calcarata*. An examination of a very large series of specimens fails to show any decided intermediate form between the two species. Mr. R. Tate separated it as a variety of *Aporrhais calcarata*."

Turritella granulata (Sby.) Very common at Blackdown; found also at Haldon.

T. costata (Sby.) Bristol Museum.

T. angulata (D'Orb.) Mr. Vicary's collection.

T. ? species. From Combe Rawleigh. Mr. Vicary's collection.

(F) *Scalardia Fittoni* (J. S. Gardner). Figured in *Geological Magazine*, 1876, pl. iii. fgs. 10, 11. British Museum. Jermyn Street and Bristol Museums.

(G) *S. climatospira* (J. S. Gardner). Figured in *Geological Magazine*, 1876, pl. iii. fig. 13. British and Bristol Museums.

(H) *S. pulchra* (Sby.) Figured in *Geological Magazine*, 1876, pl. iii. Bristol Museum.

(I) *S. Dupiniana* (D'Orb.) British and (?) Jermyn Street Museums, and Mr. Vicary's collection.

* Quoted in *Trans. Devon. Assoc.*, p. 346. 1870.

- (J) *S. Queenii* (J. S. Gardner). Figured in *Geological Magazine*, 1876, pl. iii. f. 3. British Museum.
 (K) *S.* (? species). From Haldon. Collection of Mr. Vicary.
 (L) *Disocheta Mëyeri* (J. S. Gardner). Figure in *Geological Magazine*, 1880, pl. iii. f. 5.
 (M) *Pyrgiscus? Woodwardii*. *Geological Magazine*, 1876, p. 112. British Museum.

The eight above, lettered from F to M inclusive, are united by Mr. J. S. Gardner under the family "Scalidæ."

- Littorina gracilis* (Sby.) Fitton, pl. xviii. f. 5. Jermyn Street and Bristol Museums. Mr. Vicary's collection and others = *Cerithium gracile*.
L. Pungens (Sby.) Fitton, pl. xviii. f. 5. Jermyn Street and Bristol Museums. Collections of Mr. Walrond and of myself.
L. monilifera (Sby.) = *Turbo moniliferus*. Jermyn Street, Bristol, and Albert Memorial Museums. Collections of Mr. Vicary and myself.
Solarium ornatum. Taunton Museum.
Dentalium cylindricum (Sby.) Jermyn Street Museum.
D. medium (Sby.) Jermyn Street and Bristol Museums. Collections of Mr. Vicary and others. Found also at Haldon.
D. ellipticum. Given in Sowerby's *Mineral Conchology*.
Actæon affinis (Sby.) Common; found also at Haldon.
Avellana incrassata (Mant.) = *Ringicula incrassata* (Sby.) Common; found also at Haldon.
Phasianella striata (Sby.) Bristol Museum. Mr. Walrond's collection. Fitton, pl. xviii. f. 15.
P. pusilla (Sby.) Bristol Museum. Fitton, pl. xviii. f. 13.
P. formosa. Bristol Museum. Fitton, pl. xviii. f. 14. ? = *Actæon affinis*.

CEPHALOPODA

All the known Blackdown Cephalopoda belong to the Tetrabranchiate division.

- Nautilus*. Two species, unnamed. Albert Memorial Museum. Collections of Mr. Vicary, Mr. Walrond, and the late Mr. Fox.
Ammonites varians (Sby.) Bristol Museum. Mr. Vicary's collection.
A. varicosus (Sby.) Jermyn Street and Bristol and Taunton Museums. Collections of Mr. Vicary and Mr. Walrond.
A. Goodhallii (Sby.) The commonest form of Ammonite at Blackdown.
A. falcatus (Mant.) Bristol Museum.
A. splendens (Sby.) Bristol and Taunton Museums. Collections of Mr. Vicary and Mr. Walrond.
A. auritus (Sby.) Bristol Museum.

- A. denarius* (Sby.) Bristol and Taunton Museums. Collections of Mr. Vicary and Mr. Walrond.
A. tuberculatus (Sby.) Bristol Museum. Mr. Walrond's collection.
A. Beudantii (Brong.) Jermyn Street Museum.
Taxoceras emerinianus (D'Orb.) Mr. Vicary's collection = *Hamites spinulosus* (Sby.) Bristol Museum. Mr. Vicary has a portion of an Ammonite from Haldon, too fragmentary for determination. It is the only instance of an Ammonite, or indeed of any Cephalopod, from Haldon with which I am acquainted.

I add a table of fossils which seem to be almost peculiar to Haldon, where they occur in the upper beds only. For information about these I am mainly indebted to Mr. Vicary, to whom also I am indebted for the opportunity of comparing the Blackdown with the Haldon specimens, and for much other information bearing upon the subject. In the lower beds at Haldon, which appear to be identical in character with the Blackdown beds, the fauna, and especially the Gasteropod fauna, is much more scantily represented than at the latter place. But it should be remembered that the Blackdown beds have been extensively worked for many years, and that this has not been the case at Haldon.

List of Haldon fossils not found, or rarely found, at Blackdown:

PLANTÆ.

A portion of a cone of some tree, probably akin to *Sequoia*.

SPONGIDA.

Radiolites. Mr. Vicary's collection.
 Some other forms unnamed.

RHIZOPODA.

Orbitolina concava (Lamx.) Jermyn Street Museum, and Mr. Vicary's collection.
Parkeria sphaerica (Carter). Jermyn Street Museum.

ACTINOZOA.

Prof. Duncan, in a paper published in the *Quarterly Journal of the Geological Society*, February, 1879, gives the following list from Haldon:

Peplosmilia Austeni (Ed. and H.)
Placosmilia cuneiformis (Ed. and H.)
P. Parkinsoni (Ed. and H.)
P. magnifica (Duncan.)
P. depressa (E. de From.)
Cyathophora monticularia (D'Orb.)

Favia minutissima (Duncan.)
Astro-cænia decaphylla (Ed. and H.)
Isastræa haldonensis (Duncan.)
Trochomilia varians (Reuss.)
Haldonia Vicaryi sp. nov. Pl. viii. f. 2, 3.
Stelloria nicrustans sp. nov. Pl. viii. f. 4, 5.
Baryhelix reticulata sp. nov. Pl. viii. f. 1.
Thamnastræa belgica (Ed. and H.)
T. Ramsayi sp. nov. Pl. viii. f. 6.
Oroseris haldonensis sp. nov. Pl. viii. f. 9, 10.
Actinacis stellulata sp. nov. Pl. viii. f. 7.
A. insignis sp. nov. Pl. viii. f. 8.
Trochoseris constricta sp. nov. Pl. viii. f. 11, 12.
T. Morrisi sp. nov. Pl. viii. f. 13-15.
Heliopora cærulea (Grimm.) Pl. viii. f. 16-18.

Of these the last twelve are either new species or new to the locality, and are described and figured from Mr. Vicary's specimens. *Smilotrochus Austeni* (Ed. and H.), is also in Mr. Vicary's collection. See Blackdown list.

POLYZOA.

Several species, unnamed. Mr. Vicary's collection, Mr. Walrond's, and others.

BRACHIOPODA.

Rhynchonella Cuvieri. Mr. Vicary's collection.
R ? species. Mr. Vicary's collection.

LAMELLIBRANCHIATA.

<i>Pecten ? elongatus.</i> <i>P ? striato-costatus.</i> <i>Spondylus striatus</i> (Sby.) <i>Lima ? rapa.</i> <i>Arca rotundata</i> (Sby.) <i>Cucullæa ?</i> species.	}	Mr. Vicary's collection.
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Trigonia nodosa. Albert Memorial Museum.
T. archiaciana (Lycett). Fig. in "Monograph on Fossil Trigoniæ,"
Pal. Soc., pl. xxiii. f. 7. Mr. Vicary's collection.
Opis Galliennei (D'Orb.) Mr. Vicary's collection.
O ? species. Mr. Vicary's collection.
Gastrochæna (? species,) siphonal orifices of. See Woodward's
Manual of the Mollusca, p. 542.

GASTEROPODA.

<i>Solarium ?</i> . Mr. Vicary's collection. <i>Turbo ?</i> species. <i>Gasteropod</i> , new genus.	}	Jermyn Street Museum.
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VERTEBRATA.

Vertebrates appear to be represented by a single amphicalian vertebra, supposed to be that of a Placoid fish. Mr. Vicary's collection.

It has been a matter of regret to me that, in consequence of the late removal of the fossils of the British Museum to Kensington, I have only been able to avail myself of that valuable collection in a few instances, and then only through the medium of the *Geological Magazine*.

* * * * *

I have a few further remarks to add which have but an indirect bearing upon "Blackdown," but which seem scarcely to necessitate a separate paper.

Two miles westward from the whetstone pits of Blackdown is the village of Kentisbeare. The lanes on the way show good sections of the Rock Sand and Red Marl of the Trias. At Kentisbeare are beds of coarse Triassic gravel, a geological feature, as pointed out by Mr. Ussher, extending intermittently, and with lithological variations, from Budleigh Salterton, through Kentisbeare, to the Dolomitic Conglomerate of Thorn St. Margaret, if not still further northward. A stream cuts through the pebble beds at Kentisbeare, the valley becoming more precipitous and narrow in the strike of the pebble beds, and widening out again to the westward of them. In that valley my house is situated, and hence probably it is that I have been induced to give a little attention to this rather unpromising field. It has been said that no pebbles derived from igneous rocks have been found in these pebble beds. I do not venture to directly dispute this, but I submit to the inspection of the meeting some pebbles which I have collected from the Triassic gravels of Kentisbeare, Uffculme, and Burlescombe, and which to me are very suggestive of the rocks of felspathic trap, which occur most generally between Exeter and Thorverton, and more sparsely as far north as Washfield. Pebbles of this character appear to me to increase in numbers as one goes northward along the exposures of the pebble beds at Kentisbeare, Uffculme, and Burlescombe. If these be taken to be samples of felspathic trap, we have one more testimony to the derivation of Triassic material from the south and west. Most theories of the derivation of the Budleigh Salterton pebbles point to the south-west. The Thurstlestone outlier was said at last year's meeting to have been derived from the

Bolt, which lies south-south-west of it.* The dolomitic conglomerate of Thorn St. Margaret is evidently derived from the calcareous rocks to the south-west of it. And if a line be drawn somewhat to the south of south-west from Burlescombe it would traverse felspathic trappean rocks, and more of them than a similar and parallel line drawn from Kentisbeare.

Westward again from Kentisbeare lie the high level gravels of the Culm. Just about at their junction with the Trias, as (I believe) they have been mapped by Messrs. H. B. Woodward and Ussher, my eldest boy, in September last, found a palæolithic implement of chert. The finder, then fourteen years of age, and an *alumnus* of Totnes Grammar School, saw at a glance that it was artificially shaped, and consequently brought it to me. A notice of this implement appeared in the *Geological Magazine*, October, 1879, where the editor kindly volunteers a note to the effect that the implement appears to him to agree closely with that drawn by Dr. John Evans (Pl. ii. f. 17), in his work on *Ancient Stone Implements*.

This is decidedly a digression from "Blackdown." But in digressing from Blackdown we are following the example of the stream; and having now thereby reached the Culm Valley gravels, I cannot resist the temptation of asking my hearers, or readers, to go with the stream and with me a little further. The Culm leads us to the Exe, and the Exe to Exmouth. All Devonshire people are familiar with the Exmouth Warren, and most railway travellers in Devonshire must have observed the difference in colour between the sea beach at Exmouth, and that on either side of it. The obvious reason, I need hardly say, for this difference is that, whereas the ordinary beach is mainly the waste of the sea cliffs, the accumulation opposite the river's mouth consists mostly of what the river has brought there. What in this case is that? The Warren, the sand banks, and the littoral zone, off the mouth of the Exe, whence came they? The Exe, no doubt, brings down a certain quantum of comminuted hard Palæozoic grit. Both the Exe and the Culm must bring down much of the looser Trias. But probably the still more rapid denudation of the Greensand accounts for more than either. Blackdown and Haldon are furrowed by deep ravines. Where has the material gone? Blackdown and Haldon were doubtless once united. What has become of the beds represented by the vast hiatus? We look to Exmouth Beach and

* *Trans. Devon. Assoc.*, 1879, p. 325.

Warren for an answer. There we find Blackdown once more with a new lease of life (so to speak), and with new blood infused into it. In a word, Nature, eschewing her usual tortuous ways, has by simple water carriage turned an old littoral deposit into a new one. The difference is mainly this: The moorland solitude is exchanged for the seaside watering-place and its two lines of railway, between which

"The stately ships go on
To their haven under the hill ;"

while the naturalist, instead of looking for *Cardium Hilla-num* and *Macra angulata* amid furze-brake and heather, picks up *Cardium edule* and *Macra solida* amid bladder-wrack and bathing-machines.

P.S.—The collection of Blackdown fossils quoted above as having belonged to the late Mr. Fox is now in the Taunton Museum.

ON THE BORING FOR WATER AND THE
SINKING OF TWO WELLS,
AT THE TWO LARGE BREWERIES, THE "CITY" AND
"ST. ANNE'S," IN EXETER.

BY EDWARD PARFITT.

(Read at Totnes, July, 1880.)

THE boring for an extraordinary supply of water to the two large breweries in Exeter, is as interesting from a geological point of view as it is from the utility of the water obtained. It is also interesting, and of some importance, to know what the water supply really is from certain geological formations through which borings might pass. Usually, quality as well as quantity is of great consequence, but the special purpose for which these wells were bored was to obtain water for cooling purposes only and not for brewing. Quantity was the chief desideratum; the rapid cooling of the liquor, as it is called, being of the first importance in making beer. Hence the great expense these two establishments have incurred in sinking the wells I am about to describe, with the process of boring them, and the geological formations through which they pass.

The particulars of the boring at the City Brewery were kindly furnished me by the then proprietor of the brewery, Mr. J. E. Norman. The progress at St. Anne's I have watched myself from the beginning until its completion. The work in both places has been done by the same firm. The boring apparatus is of simple construction, and consists of a steel tool shaped like the letter S, six inches in diameter; this is affixed to an iron rod, and as the boring goes on other rods are screwed on to the first from time to time, to add to the length, until the hole is sunk to the depth required. The boring tool is worked by a steam engine, which is made to lift it to a certain height and then let it fall suddenly

so that it really is a kind of pounding process rather than boring; every time the tool falls an attendant, who sits close by, gives it a slight turn round in the hole, and by this means the bore is made circular. Where the rock is very hard the process of boring is very slow indeed, thus at St. Anne's, on June 26th and 27th, it took two entire days to sink one foot, although the engine was working at the rate of forty strokes a minute.

A great deal of time is consumed in clearing the bore-hole of the pounded rock, which is in most instances little more than mud when brought to the surface; the water oozing out from the sides of the hole saturates the triturated matter, which has to be got out at certain times to allow the work to proceed. An iron tube, called a "bucket," just fitting the bore-hole is used for this purpose; it has a valve at the lower end opening inwards, the upper end of the tube being open; when this is sent down the valve is thrust open by the mud, which passes into the tube; when the bucket is raised the valve closes, and the contents are brought to the surface. Hard nodules and pieces of rock, which escape the pounding process, are occasionally brought up, so that the strata through which the boring instrument passes can be carefully examined. Pieces of rock from the sides of the bore-hole also sometimes fall into the bucket; these give us another opportunity of examining the strata. Such is the process of boring these deep wells.

The first I will take is the well at the City Brewery, the boring of which was begun in 1846, and went on, with the addition of making a large well with reservoirs or adits driven in at right angles to the well for the accumulation of water, to 1849, before it was completed. The well at this brewery is situated near Exe Bridge, and is on a level, or nearly so, with the river. The first 15 feet was through river gravel, then there were 85 feet of shillet or Carboniferous shale, then 54 feet of alternate layers of trap and red shillet, then 90 feet of blue shale, below this 3 feet of what was termed by the well-sinker water-sand, next followed 23 feet of blue shale, making together a depth of 270 feet.

There is one peculiarity here which if true is, from a geological point of view, exceedingly interesting, and that is the 54 feet of alternate layers of trap and red shillet. To the south-west of this well, at a distance of about a mile, we have a large mass of trap at Pocombe; and on the north-east, at about half-a-mile, we have the mass of trap called Rougemont,

on which the castle stands. Whether there is any connection between these two masses of trap I cannot from my own knowledge pretend to say, but there is a nearer patch or dyke of trap lying between the river and Pocombe, in a quarry now disused, below Barley, so that it is not improbable that the boring for this well may have struck a connecting dyke at the depth of 54 feet below the river gravel. There is however, generally speaking, a difference between the lithological character of the Pocombe and the Rougemont trap; the latter, as a rule, is lighter coloured and more vesicular. At the same time we have in the Pocombe quarry both varieties—vesicular and compact, diversities of structure which do not militate against the hypothesis of the connection between the two. The quality of the water from this well is very good, but it is used, I am informed, for cooling purposes only, the water for brewing being supplied from St. Anne's well, formerly known as Lion's Holt well, from which the brewing water for the St. Anne's Brewery is also derived. This well or spring in former times used to supply the city with water, which was conveyed in leaden pipes from the source. The spring is just on the junction of the Trias or New Red Sandstone and the Carboniferous formations, and, strictly speaking, it is in the New Red Sandstone. The water is considered equal, for brewing purposes, to that obtained from the same formation, and for the same purpose, at Burton-on-Trent, whence the so-called Burton Ales.

The history of this spring is of great antiquity; and it appears to have been utilized as early as the city was walled in, and very probably before, but by what means the water was then conveyed into the city I am not prepared to say. There is, however, a subterranean passage very firmly built, through which the water is conveyed in leaden pipes. The passage has several branches dividing off from the main course, which reach to several parts of the city. There is, I think, every probability of this passage having been constructed by the Romans during their occupation;* the name of the spring or well is that of a Roman Saint, namely, St. Anne, the highest name except that of St. Anne's daughter, the Virgin Mary, in the Roman calendar. If the well is to be regarded as a fair emblem or representation of the purity of the saint, she was good indeed, for the water is excellent.

* Bealey's *Itinerary* says that the water was first conveyed from St. Sidwell's to an enclosed building in St. Peter's Yard, and from thence to the conduit, in 1346, by the Dean and Chapter of Exeter (p. 34).

There is another well, or rather was, for it has been bricked up, to the great inconvenience and discomfort of the people living in the vicinity; for this was much used by them, and considered very good. This well, or spring, has been known for a great many years past as Captain Cook's, for the reason that this Exeter celebrity lived in the house adjoining it; the proper name is, I believe, St. Sidwella's, or Sativola's, well. I introduce this well for this reason: In 1862, during the visit of the Archaeological Association Congress, held at Exeter, the late Mr. W. Dawson exhibited a model of what he called St. Sid's Well. The model was really that of St. Anne's, and Mr. Dawson, in explanation of his model, went to show how this fine water supply had been destroyed by the cutting of the South Western Railway, which did certainly cut right into the spring, but did not destroy it. The spring can now be seen, covered up, on the Exeter side of the mouth of the tunnel on the left hand side as you leave Exeter, at what is known as Lion's Holt.

To supply the conduits in Exeter, the authorities directed that a water ram should be erected on the opposite bank of the railway, so as to give, as far as possible, a supply to the conduits the same as before the line was cut.

Saint Sidwella's Well was dedicated to her, and it marks the spot where she is said to have been murdered. There are several versions of the story, but the following, perhaps, is as genuine as any of them.

"Saint Sidwell, or Sativola, V.M. 740, was martyred and buried near St. Sidwell's Church, Exeter, and afterwards canonized and much esteemed for her sanctity. William of Worcester has this record of her, 'Sancta Sativola virgo canonizata ultra portam orientalem.' Near to this still exists an ancient well, supplied by a fine spring named St. Sid's Well, by which, according to tradition, she lived the life of a recluse. She was commemorated on December 18th. There is a representation of her in the east window of Exeter Cathedral, with a scythe in her hand and a well behind her. This is probably only a rebus upon her name, which is sometimes written Sithewella. On one of the columns of the Exeter Cathedral she is represented carrying her cut-off head."*

Bishop Grandison, in his *Legenda Sanctorum*, states that St. Sidwella was the eldest of four devout sisters, daughters of Benna, a noble Briton residing in Exeter. On his death, her cruel and covetous step-mother, envious of the fortune of

* *Calendar of the Anglican Church*. p. 287. Illustrated.

St. Sidwella, who inherited considerable property in the eastern suburbs of this city, engaged one of her servants, a reaper or a mower, to become her assassin, which he did, whilst she was occupied in her devotions, near the well in Hedwell Mede, at a little distance from the parish church which still bears her name. The locality of the spring agrees very well with this, as it is situate in what is now called Well Lane. Some time hence, people may wonder why this street is so called, as the well is not now to be seen; it has been destroyed, and the site is occupied by a house which has been built upon it. The well, however, is distinctly marked on Roque's Map of Exeter, dated 1744, as Sidwell's Well.

This, I think, clears up the confusion made by Mr. Dawson between the two wells, St. Anne's and St. Sidwell's.

St. Anne's Brewery is situate at the back of the Barnstaple Inn, in North Street, and is about a quarter of a mile from the Exe at Head Weir. It stands on a small escarpment of the Carboniferous rocks, which at this place was quite free from the deposit of river gravel which is found at higher levels, and which reaches to the Post Office in Queen Street. The Rougemont Hotel stands on a patch of this gravel. There is an entrance to the brewery by the side of this hotel, so that it lies between the Barnstaple Inn on the one hand, and the Rougemont Hotel on the other. The boring was begun in March, 1879, and was continued almost without interruption to the beginning of September, when a depth of 305 feet was reached. For the first 80 feet it cut through the common Carboniferous shale: at 86 feet grains of rounded quartz (white and red), and at 90 feet fine flakes of mica, imbedded in bluish sandy mud or clay, were brought up. From 96 to 100 feet, which was reached on April 1st, it penetrated some hard bands of very compact shale, with large ferruginous nodules. At 106 feet the strata was composed of soft shale, and at 112 feet another hard band was encountered. On the 28th April the bore was in a dense dark blue shale, which, when brought to the surface in the bucket, formed a very tenacious clay; this was very difficult to work, as the tool stuck tight in it, and at last the engine broke down. As soon as the machinery was repaired the work went on again; the strata alternating with hard and soft bands.

On May 24th a bright ferruginous shale was struck at 180 feet, and here occurred a fissure, for the tool went down five or six feet at almost one blow.

On the 3rd June they were working night and day, and at 204 feet struck a bright red gritty shale, but this was not

very thick, and at 210 feet they were again in dark blue soft clay. On June 27th the tool struck the hardest band of rock yet encountered, and consequently but little progress was made; though the engine was working at 40 strokes a minute, with the weight of the tool and 222 feet of thick iron rods pounding away at the rock, it seemed almost for a time to defy the assault.

On July 3rd, 6 p.m., the boring had reached 230 feet, but the rock being very hard, only six inches were bored all the day. July 8th, still in hard rock until 12 at noon, when the borer got into a comparatively soft tenacious blue clay at a depth of 242 feet. Several breakages in the machinery occurred here. This clay, as before mentioned, was most difficult to work in, and the bore-hole had to be cleared so very often that much time was consumed, the iron rods having to be taken to pieces every time the bucket is sent down. On July 28th, bands of hard and soft shale, alternating to 280 feet, were pierced, when a band of very red soft shale, with a thin bed of what the workmen called "water-sand," a very gritty clay, was reached. On August 14th, at a depth of 300 feet, still Carboniferous shale prevailed, and no water of any consequence; but what they did get it was believed came from the so-called water-sand. At 305 feet the boring was suspended, but no water rose (as frequently occurs), and as had been hoped; and there were very grave doubts as to the success of the undertaking. But, however, after the sides of the hole became cleared of the mud that was made in the process, the drainage to the hole was freer, and water flowed faster, and it went on increasing until it gave sufficient encouragement to sink a well near to the bore-hole so as to accumulate the water. The proprietors consequently had a well sunk 100 feet deep, and also three adits driven at right angles to the well at that depth. These chambers are four feet wide and six feet in height.

The quantity of water now obtainable for cooling purposes from this bore-hole and well, is about 120 barrels in twenty-four hours. The water, however, is not so cool as could be desired for the purpose to which it is put; it had a temperature, in April, 1880, of 55 degrees. This would rather lead one to suppose that it came from a great depth, or that it passed over or had come near some heated rock; but rocks of different densities or compactness, and also rocks of different geological formations, give different results. Thus many mines in Cornwall and Devon exhibit increments of temperature equal to 10 degrees each, at intervals of about 47-79 and 125

fathoms of descent. Thus in the slate of Cornwall, at from surface to 50 fathoms, the mean temperature stands at 57 degrees.*

In the New Red Sandstone, a mean depth of 15 fathoms gives a mean temperature of 54 degrees.†

On comparison therefore with these observations, the temperature of the water at the new well at St. Anne's Brewery is rather below than above the mean temperature of the Devonian rocks of Cornwall.

The temperature at St. Anne's well or spring at Lion's Holt in July last year (1879) was 54, and the lowest reading in January, 1880, was 44 degrees. The variation of ten degrees between summer and winter shows at once that this is not a deep seated spring, and it being, as before stated, just on the junction of the New Red Sandstone and the Carboniferous formations, the greater portion of the water obtained from this source, I believe, comes from the drainage of the slate or shillet, and not from the New Red Sandstone. Geologically speaking, the New Red Sandstone lies above the Carboniferous; but in this district the latter has been from internal disturbances elevated much above the former, hence the drainage before mentioned.

This spring is also quickly affected by the rainfall, as the measurements of the depth of water in the spring-head taken every Monday show. Thus on September 8th, 1879, the water stood at 2 feet 7 inches, and, according to our register at the Devon and Cornwall Institution, we had 70 parts of an inch of rainfall. On the 15th of same month the spring marked 3 feet 5 inches, and the rainfall on the 13th was 30 parts of an inch. The difference here of ten inches from the time the rain fell and the time the depth of water was taken at the spring, will be explained by the two days' drainage of the rocks.

The following analysis of the water at St. Anne's Well, Lion's Holt, have been kindly supplied me by Mr. F. Perkins. The analysis was taken in May, 1874:

Results stated in parts per 100,000:

Solid contents	.	.	48·57
Free Ammonia	.	.	·0016
Organic Ammonia	.	.	·0022
Nitrogen as Nitrates	.	.	·0376
Chlorine	.	.	4·9

* HENWOOD on *Metalliferous Deposits and on Subterranean Temperature*, vol. ii. p. 760.

† HOPKINS, *Phil. Trans.*, vol. cxlvii. pp. 808-18-19.

A second analysis taken of water from the same spring, but drawn from the supply in the Cathedral Close, October, 1877, is as follows :

Free Ammonia	.	.	·0025
Organic Ammonia	.	.	·0072
Nitrogen as Nitrates	.	.	·321
Chlorine	.	.	5·7

The chlorine is calculated as common salt. The excess in organic ammonia in the latter analysis is probably due to the decaying matter at the season of the year when this examination was made.

The water in the well at St. Anne's Brewery has not been analysed.

At the City Brewery, as before stated, the well is 270 feet in depth. The water in this gives an average temperature of 53 degrees; and, as I am informed by the proprietor, Mr. Pring, it does not vary more than two or three degrees throughout the year.

SOME RELIGIOUS HOUSES OF TOTNES.

BY EDWARD WINDEATT.

(Read at Totnes, July, 1880.)

IN addition to the Priory of St. Mary, Totnes, founded by the Norman Baron, Iudhel de Totnes, there were in different parts of the parish of Totnes several chantries, founded by pious persons, in which priests might say masses for their souls and those of their relatives.

Three such appear to have existed in Totnes, and there was, in addition, a fourth, which was more a hospital than a chantry, being founded for the relief of lepers.

A short sketch of these four houses may be of interest; and on another occasion it is to be hoped that some member of this Association will furnish us with an account of the more important religious house, the priory of St. Mary.

The four we now notice are the chapels of St. Peter; of St. Edmund, King and Martyr, and St. Edward the Confessor; of the Holy Ghost and St. Katherine; and the House of Lepers of St. Mary Magdalene.

THE CHAPEL OF ST. PETER.

The chapel of St. Peter was one of the earliest of the religious houses in Totnes, for Iudhel de Totnes, to whom William the Conqueror gave the barony of Totnes, in a charter, by which he gives the church of St. Mary to the monastery at Angers, mentions a chapel of St. Peter in or near Totnes.

Anthony, Cardinal Bishop of Aguiuleia, granted an indulgence of one hundred days to all benefactors and pious pilgrims to this chapel of St. Peter, near the town of "Tottoneys," situated between the town and the sea (river), and who should pray for the souls of John Thomas, Jane his wife, and Stephen de Lafount, who appear to have been its founders.

This indulgence is dated from Rome, Nov. 12th, 1421, in the fifth year of the pontificate of Martin V.

On the 25th April, 1442, Bishop Lacy granted an additional indulgence to the visitors and benefactors of this chapel; and in a parchment roll of the law court of the mayor of Totnes, 28th Henry VI. (A.D. 1449-50), occurs the appointment of wardens of the chapel of St. Peter.

Of this chapel no trace whatever remains, nor is its exact site known; it appears probable that it stood on a spot near the Bowling Green Quay. The quay adjoining is to this day called St. Peter's Quay.

**THE CHAPEL OF ST. EDMUND, KING AND MARTYR, AND
ST. EDWARD THE CONFESSOR, NEAR THE BRIDGE.**

This chantry or chapel for priests to sing masses in, is said to have been founded by William de Cantilupe, who held the honour or barony of Totnes in Henry III.'s reign, for the maintenance of a priest to pray and say masses for his soul. This nobleman, as Lord of Totnes, in 1238, exempted the abbot and convent of Torre from the payment of manor tolls in Totnes.

The chapel was dedicated to St. Edmund, King and Martyr, and St. Edward the Confessor, and was situated upon the old Totnes Bridge, at the end of it, on the Totnes side. The old bridge crossed the river just above the present bridge; and the remains of this chapel are remembered by persons now living. An old archway was among the last memorials of this building, and it was latterly used as a blacksmith's shop.

In 1536 Bishop Veysey valued the revenues of this chantry at £4 13s. 4d., and it was then served by John Ryder, and it appears from the chantry rolls for Devon that about 1545 the yearly value of the lands and possessions was £7 17s. 11d.

The Zouch family, who succeeded Cantilupe in the barony of Totnes, presented to this chapel.

The abbot and convent of Buckfast had several tenements in Totnes, near the bridge.

From the chantry rolls valuation we learn that the priest serving this chapel had for his living certain lands appointed by the founder. The entry goes on to say:

"The sayd Tottnes is a borough towne and a greate parochie being pepled by estymacion wythe DCCCC houselyne peple. The yerely value of all the lands and possessions belonging or appertaining to the sayd Chantrye, as by particular book hereof

made at large more playnlye maye appere vij^{li} xvij^s xi^d, which possessyons and yerelye value Wyllm Escot now Incumbent there hathe durying his natural life w^towt any resolucion going out of the same only paying unto the Kyngs Maiestye the xth which is now here defalked vi^{li} xvij^s xi^d.

"The value of the ornaments, jewels, plate goods and catalls, belonging or appertayning to the said Chauntrye, as by a particular inventorye thereof made at large more playnlie apperythe Lvij^s viij^d over and beside tow bells hanging in the west end of the Chapell belonging to the said Chauntrye."

This chauntry shared the fate of so many others in the land. Where its lands were situate is not now known. The chapel must have been of good size, and had, as appears above, two bells in its western end.

Henry Cheeswill, of Totnes, by his will dated 19th August, 1433, gave to Galfred Veale, canon and rector of the church of St. Edmund, super pontem Totton, 4d. It will be noticed that in this will it is spoken of as a church, and the priest as the canon and rector.

THE CHAPEL OF THE HOLY GHOST AND ST. KATHERINE AT WARLAND.

This chapel was begun to be erected the Friday next after the feast of St. Matthew the Apostle, 1270. The Lord Bishop on that day received seizen of the house and garden of Walter le Bon and his wife Agatha, in the presence of a multitude of persons, and commanded that a chapel should be there erected, in the name of the Holy Ghost and the Blessed Virgin Katherine.

It seems that Walter le Bon bought the land on which this chapel stood from the widow of Andrew le Scot, in 1251, and by a deed of that date she conveyed all the land in the "Wereland," which pertained to her as widow of Andrew le Scot, to the said Walter le Bon and his heirs.

From an entry on a roll in Latin, dated A.D. 1272: "In the third year of the reign Edward I., William de Cyrecestre, the Lord of Little Totoneys, granted unto Walter le Bon a road for him and his so long as he should live, both on foot and on horse, and leave to make a certain bar on the north side, near to the mill of Little Totoneys, such right being to go and return between the said Bar and Bourdone."

Among the names of members of the Merchant Guild of Totnes appear the names of Walter le Bon, Agatha Bona, and

Andrew Scot, and the following entry: "Andrew Scot sits below the seat of Geoffrey Rustic, it being the gift of Alice, wife of Walter Cordela."

Bishop Tanner speaks of two convents of Trinitarian Friars at or near Totnes.

Leland mentions only one, founded by De la Bout, or De la Boate, and which was subsequently suppressed by Bishop Oldham, who gave the lands to the priests vicars of the Cathedral Church of Exeter; and it is supposed by some persons that this chapel, founded by Walter le Bon, was built near this convent, and surrendered to it at the time the chapel was dedicated.

Generally, a priest of the Holy Trinity House, at Hounslow, in the Diocese of London, was appointed to serve this chapel, who was called "Magister domus Sancti Spiritus de Warlond;" but the collation to it was absolutely vested in the Bishops of Exeter.

The following is a list of some of the wardens or priests who served this house:

Robert de Dunyngton, 1378, on his appointment to be prior of Hounslow.

Thomas Person, 1378-1401.

Hugo Heyuns, 1401-1427.

William Uywenton, 1427-1437.

Richard Dobyus or Zalyans, 1474-1503.

Nicholas Byll, 1503.

During the time Person was the warden, viz., in the autumn of 1384, this chapel was sacrilegiously profaned.

On the 12th January, 1508, Bishop Oldham obtained the license of Henry VII., who was then at Croydon, to appropriate this chapel to the priests vicars of the Cathedral of Exeter. This arrangement seems to have given great offence to William Thompson, brother at Hounslow, who intruded himself into the chapel, but was forced to make humble submission to the bishop in the chapel of the Blessed Mary, within the episcopal palace, without Temple Bar, London. Brother Thompson made this submission on February 15th, 1512, and eight days after his brother, Richard Richardson, who seems to have been mixed up with Thompson in the matter, followed his example.

Chapels of this order were often chosen as places of burial; for Pope Honorius III., by his Bull directed to William and his Brethren of the Order of the Holy Trinity, dated April 25th, 1224, granted the privilege of burial to their houses. It

does not appear whether this chapel, or the ground surrounding it, was ever used for burial or not.

It is probable that, shortly after the appropriation by Bishop Oldham, it ceased to be used as a religious house, and was let.

It remained in the possession of the vicars choral of Exeter Cathedral until the suppression of the religious houses, when it appears to have been appropriated by the Crown; but in the reign of Queen Elizabeth her Majesty issued letters patent, by which she gave back to the petitioners the charity lands and tenements and rent which had been appropriated, and among the list appears this chapel, as follows:

"All that Chapel of the Holy Ghost, in Warland, near Totnes, which had been appropriated to the custos and college, as from his deed, bearing date the 13th February, 1508, more fully appeareth."

After the vicars choral again obtained it, it remained their property until 1801, when it was sold under the Land Tax Redemption Act. It seems that the land connected with it reached from Warland up to the Almshouses; and the fact that there was so much land attached thereto would seem to favour the idea that there was at one time a convent there to which the chapel was attached, as stated by Leland.

The only trace of this ancient chapel is to be found in Warland, about half way down the street, where there is now a dwelling-house, the walls of which are of unusual thickness, as can be seen on examining the doorway and openings for the windows; and it does not seem improbable but that these are the original walls of the chapel, which, as we have stated, was soon after its appropriation converted into a dwelling-house. It is said that formerly there were in the garden at the back traces of old walls, but these now seem to have disappeared.

THE HOUSE OF LEPERS OF ST. MARY MAGDALENK.

This religious house, or hospital, was founded at a very early period, but the exact date of its foundation is unknown. It was founded for eleven lazars, or lepers, and was endowed with lands which were valued in 1547 at £5 15s. 8d. per annum, at which time there were eight lepers in the house.

The earliest mention of this house is in a document among the papers of the corporation of Totnes, dated April 23rd,

1384, purporting to be an appointment by the master, brethren, and sisters of the Hospital of Leprous Persons of the blessed Mary Magdalene, of Totnes, under their common seal, of one of their brethren to be the proctor for conducting their causes and affairs.

In the Chantry Rolls of Devon occurs the following entry under the head of Totnes, referring to the "Hospytall called the Maudelyn,"—"There is abiding at this present in the hospital, eight poor lazar people, which be more than the profits of the lands belonging to the aforesaid hospital is able to sustain; notwithstanding, if any be brought they be received until the said number be fully completed."

The entry goes on to say :

"Deducted for rent, resolute yearly 4d., and so remains there towards the relief of the said poor people the yearly charge of reparation not reprised, £5 15s. 4d. There is no ornaments, jewells, plate, goods or cattle, belonging or appertaining to the hospital aforesaid."

It is a very curious fact that in many instances lazar houses were built in olden times in or near towns situate on rivers where large quantities of fish were caught. This was the case in Totnes, the Dart in those times producing so much salmon that it is said it was customary to insert a clause in the apprenticeship indentures that the apprentice should not be supplied with salmon by his master more than four times a week; copies of such indentures appear, however, not to have been preserved.

It is a recognized fact that eating very large quantities of fish has a tendency to produce skin disease, and leprosy seems to be a species of this disease; the chief cause, however, may rather be said to be want of cleanliness.

At Plympton and Tavistock there were lazar houses, and in olden time salmon and other fish were plentiful at both of these places.

Leland, in his *Itinerary*, vol. iii. p. 37, speaking of Totnes, mentions a lazar house on the south part of the town, endowed with some lands.

Bishop Lacy, on January 24th, 1437, granted an indulgence to true penitents who should contribute "ad sustentacionem pauperum et Leprosorum Hospitalis Sancte Maria Magdalene Totton;" and in 1577 Walter Douse gave lands to this hospital. The allowance to the lazars was 8d. a week each.

In a parchment roll of the Totnes Mayor's Law Court, 27 Henry VI. (A.D. 1448-9), is the following entry :

"That the Brethren and Sisters of the House of Lepers of St. Mary Magdalene shall have but one fire-hearth, and that in the hall; and that from henceforth they shall not have their fuel put in their own chambers; but their fuel is to be brought into the hall where all the brethren and sisters meet in turn."

It would appear from this that some of the lepers got more given to them than others, and therefore that all was to go into a common stock and be burnt at one fire-hearth in the hall.

From the mention of the hall and chapel in these entries, it would seem that the building must at one time have been of considerable size.

Another parchment roll, 28 Henry VI., A.D. 1449-50, contains the appointments to offices for the year, and among the fourteen men sworn thereto, and appointed to various offices, occurs the appointment of "Warden of the Chapel of St. Mary Magdalene."

In the same roll it is also ordered that every brother or sister, a leper, entering the house of St. Mary Magdalene, shall, at the end of his or her life, leave there in the custody of the wardens one bed, one platter, one pot, towards the support of the house and its chaplain, unless so poor as not to be possessed of such goods.

Another entry is to the effect that Mary, late the wife of Hugh Julian, shall be a sister in the said house, and shall deliver into the store thereof two blankets, two linen sheets, one coverlet, three brass platters, one brass pot, one coffer, and one table.

About the close of the reign of Henry VIII., or in that of Edward VI., this religious house and its property came into the hands of the Corporation of Totnes; but its site, or a portion thereof, is now the property of the Totnes Endowed School Governors, and rentals are still collected from various properties in the parish called Maudlin rentals, being the amounts formerly paid towards the support of this hospital.

Amongst the Corporation papers we find the accounts of the wardens of the Magdalen for various years, some prior and others subsequent to the years 1600. From the accounts of 1594 there appear to have been payments made to poor persons, but the number of such persons is not stated. From those of 1617 there appear to have been then six persons receiving the benefit of the charity. In 1683 the rents received by the warden of the Magdalen amounted to £26 12s. 11½d.

And the disbursements of that year were as follows :

	£	s.	d.
To the Magdalen people. 52 weeks at 4s. 6d. per week	11	14	0
To the Vicar for saying prayers at the Magdalen	1	0	0
Various payments for clothing and fuel for the Magdalen people, and for the repairs of the buildings, &c.	4	2	1
	<hr/>		
	£16	16	1

In 1640 the receipts amounted to £18 14s. 0½d., and the disbursements were :

To the people of the Magdalen. Francis Saunders, 1s. 10d. per week, and John Green, 12d. per week, in all 2s. 10d. per week, for 53 weeks	7	10	0
To the Vicar	1	0	0
Clothing, repairs, &c.	4	13	0
	<hr/>		
	£13	3	0

In the accounts of William Tillard, mayor, 1648, amongst the payments are the following :

For a rope on Maudlyn bell, &c.	00	03	06
To the Maudlyn woman ringing the bell	00	02	00

In the Maudlyn accounts of 1658 no payments are stated to have been made to the poor persons.

In 1660 the receipts were £17 9s. 8d., and the disbursements were :

To Edward Langworthy, his wife and children, 53 weeks at 6d. per week	1	6	6
Other payments (chiefly for repairs, but more for clothing	10	14	0

The site of this house was adjoining the road leading from Leechwell Street to Lake Garden, where two ruined cottages now stand. In the wall at the higher end a portion of an arch may still be traced, and there are persons living who recollect before these cottages were built the ruins of the chapel, and the remains of the tracery of an elegant window. The orchard adjoining is called Maudlin Orchard, and was doubtless a portion of the grounds of the hospital. Henry Cheesewill, of Totnes, by his will dated 19th August, 1433, gave his wife a garden, called Leechwell Hay, on the east side of the garden of the Lepers of the blessed Mary Magdalene of Totnes.

This Lazar house was situated just on the border of the old borough of Totnes, and was some considerable distance from the west and south gates of the town. It was a custom when the boundaries of the old borough were perambulated and beaten (viz., prior to 1832, when the borough was enlarged by the Reform Bill), for the persons so engaged to stop at this place, go into the ruined chapel, and sing the Hundredth Psalm.

As late as 1626 there was an idea prevalent that persons were subject to leprosy; for among the papers of the Totnes Corporation is one written in a fine and beautiful hand, a petition of one Nicholas Harris, who had for nearly forty years been foot postman in Totnes.

He had, it seems, been elected by the Corporation to one of the almshouses, but some enemy had informed the magistrates that he was a leper, and he had accordingly not been allowed to occupy the almshouse until he could show without doubt that he was not so infected.

He accordingly journeys to London, most probably on foot, and prays for examination by the president and governors and surgeons of St. Bartholomew Hospital, and that they will certify whether he is a leper or not. He is accordingly examined, and found to be free from the disorder, and the following certificate is appended to his petition :

"Wee whose names are underwritten upon this petition have viewed the body of this petitioner, and in our censures he is free from the imputed disease. Tho. Wounderer (*sic*), Pres. Coll. Med. Lond, John Argent, Mich. Andrews, Sy. Baskerville, censors; Math. Groynn, registarius."

DATTON MILL AND DONITONE.

BY J. B. DAVIDSON, M.A.

(Read at Totnes, July, 1880.)

IN that edition of the Ordnance Map for Devonshire which serves as an Index to the Tithe Survey will be found, near the mouth of the river Otter, on its right or western bank, a small triangular enclosure, having its base on the river, called "Manor of Datton Mill." Within this space two or three dwellings are marked, but no church.

A visitor to this spot, approaching the river from the west, finds at the brow of the hill a sharp turn to the right in the road, bringing into view the mill and mill-house of Datton (pronounced Dotton) below him. Just at the brow, on the left of the road, is a heap of grass-covered ruins. Opposite to the mill, on the low ground, is the site of the old manor house, the present farmstead having been re-built farther away from the river, in a solid and substantial manner, by the present owner, the Hon. Mark Rolle, or his trustees. The miller, who is also the overseer, states that the manor was formerly extraparochial and tithe-free, and that it has only of late years been made into a parish for rating purposes.* There is no church, and the people marry and bury elsewhere. As to the ruins, they are supposed to be the remains of "some monastic building," and there is a story about a cup of curious workmanship having been found either here or in the old manor house, believed still to be in the possession of some member of the Duke family. Tradition connects the place with Rockbeare. The manor contains about two hundred and ten acres, and five tenements. To the north of it is Newton Poppleford, once a borough, now a large village, in Aylesbeare parish. On the south is the parish

* Under the 20th Vict. c. 19. (21st March, 1857.)

of Colyton Raleigh. The whole district is in the hundred of East Budleigh, and in the deanery of Aylesbeare.

When we come to look into the history of this singular place, we find that by modern writers it is invariably identified with the *Domesday* manor of Donitone, which was one of the three estates in Devon bestowed by the Conqueror upon the abbey of St. Michael in Peril of the Sea, in Normandy. Polwhele,* Lysons,† Pitman Jones,‡ Oliver,§ concur in identifying Datton Mill with the Donitone of *Domesday*.

As Polwhele's observations are the most full on this matter, we extract them.

Under the heading of ROCKBEARE, he says :

"The barton of Dotton (in *Domesday* and old records Donitone, vulgarly Daddon) is said to belong to the parish of Rockbeare, though situated at the distance of six miles from the church."||

Again he writes :

"Dotton, which I have mentioned as belonging to Rockbeare, was antiently a village or hamlet, though reduced at present to the house and homestead, of Dotton barton."

Adding in a note :

"It pays no rates or taxes to this parish" (i.e. Rockbeare), "but maintains its own poor ; that is, all who gain a settlement there by service or otherwise. The tradition is, that this exemption from poor rates was originally derived from an agreement between the parishioners of Rockbeare and the proprietors of the barton. This barton—however it became tax-free—being one of the demesnes of the priory of Otterton, is also tithe-free. It was late the property of John Duke, Esq., whose surname was Heath, but who assumed that of Duke when he came to the Duke estates."

The text then proceeds :

"On Dotton was formerly a chapel, long since demolished. In an old rental of 1260 we have these words, 'Et pro capella de Donitone quinque denarios.'"

And in a note is added :

"Doniton chapel, now called Dotton, was reduced from a village to a farm house. It was long since demolished. It is said to belong to Rockbeare ; but it is not a mile from Colyton Raleigh Church, to which parish the barton of Donitone joins."¶

* iii. 197, 8.

† *Devonia Index Parochialis*, p. 5.

‡ iii. 197.

† Page 428.

§ *Monasticon*, p. 248.

¶ iii. 198.

Notwithstanding the above weight of authority, when the records come to be examined they fail to support the conclusion, either that Datton Mill is the Donitone of *Domesday*, or that the manor of Datton was ever one of the demesnes of Otterton Priory.

The Donitone of *Domesday* was a manor which paid geld for three hides, having land for ten ploughs. In it there were 100 acres of wood, and 200 of pasture; and it was worth forty shillings. It is seen at once that this represents a very considerable tract of land, not less, certainly, than 1,300 acres at the present day. How came it that a place of this extent should have dwindled down to a small farm of 210 acres? It could not have been that either of the adjoining properties was originally included in Donitone, for each has its representative in *Domesday*. Newton Poppleford is found in Niwetone, folio 118 (2); and Colyton Raleigh, most probably, in Coletone (Warin's manor of that name), folio 109 (1). Moreover, small as it is, Datton has one distinguishing feature, namely, its mill; whereas the Abbot of St. Michael's manor of Donitone had no mill.

On the other hand, there is an entry in *Domesday* which suits Datton Mill exactly. It is one of the "Otrita." A number of small manors of this name are recorded in the Survey, each representing a plot of land on the banks of the Otter, some of which it is not easy to identify. This particular Otrit is at folio 107 (4). It was a place consisting of one virgate and three ferlings of land, having arable ground for two ploughs. It had a mill, rendering five shillings, two acres of meadow, and ten of pasture, and was worth seven shillings. It was held, in the time of King Edward, by Dode, who, as we learn from the *Exon Domesday*, p. 287 (folio 308b.), was a priest. This Otrit belonged at the date of the survey to Baldwin the sheriff, and was held by Rainer. The correspondence between this place and Datton is complete. Otrit, as its name implies, was on the Otter, and it had a mill. It is entered next after two Rockbeare manors, each of which also belonged to Baldwin, and also was held by Rainer—thus accounting for the traditionary connection with Rockbeare, and next to it comes Aylesbeare. The dimensions of the two places agree, and from the name of Dode, the priest, probably sprang the name Dodeton or Datton.

This original name seems to have survived the Conquest; and two centuries later we find that Doddeton, otherwise Dodington, had become a parish, and had a church. This appears from a deed of the 5th of February, 1259, preserved

in Bishop Bronescombe's *Register*,* where mention is made of an "Ecclesia Sancti David de Doddeton olim parochialis," which had been appropriated by the bishop's predecessor, William Brewer (1224-1244), to the Abbey of Dunkeswell. The occasion of this instrument of February, 1259, which is an episcopal ordinance, was certainly most extraordinary. It appears that the Dunkeswell monks had completely secularized this church, which had been granted to the use of the convent. They had appropriated the land, suppressed public worship, sold the church bells, and cast out the fonts. Being called to account for these misdeeds, they admitted the injuries, and expressed themselves willing to make satisfaction. The church was ordered to be restored to its proper rank, and the monks were enjoined to provide for the celebration of divine service, they taking the rents and revenues. If the land of the parish were to fall into the occupation of secular persons, provision was made for service being performed by a secular priest.

Dr. Oliver passes somewhat lightly over this scandalous narrative. He suggests† that Doddeton may have been Hemiock, which is the only church near Dunkeswell dedicated to St. David, and adds, "That it (Doddeton) was near Dunkeswell, may be inferred from the alleged circumstance of the glebe (*sic*) having been cultivated by the monks as their proper domain."

But apart from the solecism of rendering parochia "glebe" instead of "parish," Dr. Oliver's suggestion is overthrown by this—that in the taxation of Pope Nicholas, *circ.* 1291, Hemiock, in the deanery of Dunkeswell, and Dodyngton, in the deanery of Aylesbeare, both appear, showing them to have separate churches, and far apart. And it may be questioned whether the monks of Dunkeswell are not more likely to have ventured upon these acts of spoliation in a small and remote parish, than at their own doors in the parish of Hemiock.

Bishop Bronescombe's injunction seems to have been obeyed; for in the taxation above mentioned we find,‡ under the deanery of Aylesbeare, the entry, "Ecclia de Dodyngton," taxed at 13s. 4d.; and where, we may ask, could a church of Dodyngton have existed in Aylesbeare deanery except at this place, Datton?

Some thirty years afterwards we find notices relating to the lands of Doddeton, otherwise Dodington, in *Testa de Nevill*

* Page 11; printed, Oliver, *Mon.* p. 396b.

† *Monasticon*, p. 394 (a) note.

‡ *Mon.* p. 458a.

(1327). One is as follows : "The heir of Balestane (Belstone) holds in Rokebe' and in Dodeton one fee ;"* and the other is, "The heir of Baldwin de Balestane holds of Richard of Langeford, in Rockebere and in Dodington, one fee ; and Richard (holds) of the manor of Okemethon."† One statement is merely a repetition of the other, showing that Dodeton and Dodington were names for the same estate, and that this property was in the beginning of the 14th century still held in connection with part of Rockbeare.

We have seen above that the church of St. David, of Dodington, was granted by Bishop Brewer to Dunkswell Abbey. With it were also granted the manor lands, but they, or part of them, in 1327 had become alienated. Nevertheless, at the dissolution, it appears that the convent had again become the lord of the manor and of the manor court, subject to the payment of a head rent ; for in the *Valor Ecclesiasticus* of Henry VIII., which gives a list of both the temporal and spiritual possessions of the Abbey, amongst the former, or temporal possessions, we find :†

"DODYNGTON.

It is worth by the year in rents of assize at the same place (beyond the sum of 7s. 11d. paid every year, being 15d. for head rent at the same place, paid to Henry, Marquis of Exeter, and his heirs, and 6s. 8d. paid to John Middleton, bailiff at the same place, for his fee)	6	14	9
And from court perquisites, 10s. 3d., with other sundries, and fines of land at the same place, 20s. a year in ordinary years	1	10	3
	<hr/>		
	£8	5	0"

And amongst the spiritual possessions :

"DODTON.

A free chapel at the same place, worth by the year in ordinary years in oblations and other tenths	1	6	0
	<hr/>		
	£1	6	0"

And again, in the *Computus Ministrorum* of 32 Henry VIII. (1540-1) :

"DUNKYSWELL NUPER MONASTERIUM OOM' DEVON' (INTER ALIA).			
Dotton—reddit' assis'	.	.	£7 2 0
Firma capell'	.	.	1 6 8"

* Page 180b.

† Page 191a.

‡ *Mon.*, p. 398.

In this way the history of Dodeton, otherwise Dodington, otherwise Datton, may be traced from the Conquest to the Dissolution; and it is evident, first, that "Otrit," and not "Donitone," is the *Domesday* name for the place; and that the church and lands (the latter with some interruption of title) belonged, not to Otterton Priory, but to Dunkeswell Abbey.

A presumption that Datton Mill belonged to Otterton does, no doubt, arise from the fact that both Otterton and Datton came to the Rolle family from the family of Duke.* But the question is, How did the Duke family acquire Datton? Did it come to them by the same title as Otterton? The answer is, that it did not. Otterton was conveyed to Richard Duke by King Henry VIII. in 1540. An abstract of the deed is given by Polwhele,† who observes, "This grant is very full and circumstantial," and this it undoubtedly is. It may be read at length in the Patent Rolls, 31 Henry VIII., part 4. But it contains no mention of Datton. The expression of Polwhele, cited above, seems rather to show that Datton belonged to a Mr. Heath, who married a Miss Duke, and thereupon assumed the name of Duke.

Finally, the fact of Datton being tithe-free is no proof that it belonged to Otterton. It would have been equally tithe-free had it belonged to Dunkeswell. And this undoubtedly was the case. Nothing then remains to connect Datton with Donitone but the similarity of name, and this disappears when we consider that the root of the former name was that of the priest Dode, and of the latter the name Donne.

DONITONE.

Where then was the Abbot of St. Michael's manor of Donitone?

The three properties of the Abbey in Devon, in 1086, may be thus compared:

* "The Misses Duke sold Otterton with other lands, on the 25th of September, 1785, to Dennis Rolle for £72,000."—*Letter to Harvey's Sidmouth Directory*, October, 1850, by Peter [O. Hutchinson, Esq.].

† iii. 20.

<p>OTRITONE</p> <p>£18</p> <p>(formerly £10)</p>	<p>14 hides 25 ploughs</p> <p>50 villeins 20 bordars 33 salinarii 3 mills</p> <p>45 a. meadow 160 a. wood 180 a. pasture</p> <hr/> <p>375 a.</p>	<p>The Countess Gytha</p>	<p>Ottertton (E.B.)</p>
<p>DONITONE</p> <p>£2</p>	<p>3 hides 10 ploughs</p> <p>9 villeins 4 bordars 3 serfs</p> <p>100 a. wood 200 a. pasture</p> <hr/> <p>300 a.</p>	<p>Earl Harold</p>	
<p>HERTICOME</p> <p>£3</p>	<p>3 hides 12 ploughs</p> <p>16 villeins 8 bordars 3 serfs 1 mill 1 porcarius</p> <p>4 a. meadow 50 a. pasture 40 a. wood</p> <hr/> <p>94 a.</p>	<p>Earl Harold</p>	<p>Yarcombe (Ax.)</p>

Besides the three manors of Otritone, Donitone, and Herticome, the abbot held also the church of Woodbury.

It appears, moreover, incidentally, that Sidmouth belonged to the abbey. It is stated that the canons of St. Mary, Rouen, who held Ottery St. Mary, had a garden and a salt-work, rendering 30 pence "in terra Sancti Michahelis de Sedemuda."* Now Sidmouth does not appear as a separate manor in *Domesday*, any more than Exmouth, Teignmouth, and Dartmouth, places which were then sea-side villages, appurtenant to inland manors, and which grew into importance only when the naval power of the country was sufficient

* *Exon D.*, p. 177, f. 195.

to keep the coast clear of pirates. Sidmouth then must have been part of one of the three above-mentioned manors, and as Yarcombe, at the head of the valley, is out of the question, it must have been comprised either in Otterton or in Donitone.

Not only is there no name in Sidmouth parish at all like Donitone, but in none of the records of which the writer is aware, relating to Sidmouth, is there any mention of Donitone in connection with it. The inference is, that Sidmouth parish was, at the Conquest, part of the manor of Otritone, which from its great extent may well have comprised the two parishes of Otterton, 3479 acres, and Sidmouth, 1540 acres, making together 5019 acres. In like manner Exmouth was contained in Littleham, East Teignmouth in Dawlish, and Dartmouth in Stoke, afterwards Stoke Fleming.

There is only one document later than *Domesday* which the writer has been able to discover, containing any mention whatever of Donitone. This document is the Cartulary of Otterton Priory, of which an abstract is given by Dr. Oliver in the *Monasticon*. * A description is there given of the condition of this MS. when it was in Dr. Oliver's hands, and a summary of its contents, which fall into four classes of subjects; namely: 1. A calendar; 2. A roll of the properties of the priory; 3. A list of deeds; and 4. A custumale, or list of the customs of the manors belonging to the priory. There is a preamble by the prior, Geoffry Legat, who began compiling the manuscript in 1260, and whose memory deserves all honour and gratitude for his labours. It should be borne in mind that in early times the prior of Otterton acted as the procurator and steward of the abbot of St. Michael as to this Devonshire property; but that after the lands of the alien priories were seized to the use of the Crown the prior of Otterton had no other superior lord than the Crown. This was finally accomplished in 1414.

In the varied assemblage of records which this Cartulary contains, arranged mostly out of chronological order, and often without date, there are some seventy-three separate articles, fifty-seven being copies of deeds prior in date to the beginning of the compilation, and the rest added from time to time afterwards. The name Doniton or Donnington occurs five times, and there are two other entries bearing on the subject. To these seven entries we propose to draw attention.

The first† is a confirmation by Abbot Ralph, in 1234, to Bartholomew of Otterton, of half a virgate in Donitone, and

* Page 256.

† No. 66, *Mon.*, p. 259a.

a parcel of moor, at a rent of 7s. 8d. Unfortunately the abstract of this deed gives no hint as to the locality of the land.

The second occurs in the list of possessions of the priory itself, which stands at the beginning of the manuscript (next after the calendar), and hence may be taken to be of the date of the compilation; namely, 1260. The list comprises Otterton, Sidmouth, Hederlonde, Boddeleg', * Yerticumb, and Mertok (Martock, Som.). Under the heading Yerticumb, Dr. Oliver, in abstracting the manuscript, observes:

"The rental was £15 16s. 5d. One memorandum may deserve notice; viz., that no one but the vicar could claim the free grinding of corn in the mills of Doniton and Yarticomb."

From this we learn that Doniton had now become possessed of a mill, an appendage which it did not boast in 1086; and we learn moreover that a privilege of free use, both of Doniton mill and Yarcomb mill, was vested in the vicar of Yarcombe.

The third entry is to be found in the *customale* of the priory, which is entered in the book at page 62, and is printed at length by Dr. Oliver.* This may also be presumed to be of the date of the compilation of the manuscript, viz., 1260, though some portions are inserted in a later hand. After a variety of subjects mentioned in this *customale*, we find a statement of payments which were due to the arch-deacon for providing a vicar for the several churches of Otterton and Yarcombe; and then comes this paragraph:

"Item idem debet habere annuatim ad proximum capitulum post pascha [xxxv. den., videlicet, pro ecclesia de Otterton xv^d., et] pro ecclesia de Artycumbe xv^d., et pro capella de Doniton v denarios, et vocantur episcopalia."

The words between brackets are amongst the later insertions. Here we learn that Doniton had become possessed not only of a mill, but of a chapel; and this is the passage which led Mr. Polwhele erroneously to identify the chapel of Donitone belonging to Otterton Priory with the church of Dodington or Datton, belonging, at the same date, to Dunkeswell Abbey.

The remaining four entries have no date, but are probably somewhat later than 1264. They are as follows:

* Budleigh was granted by King Henry I. to the abbey of St. Michael in exchange for the two churches of Waldgrave and Cholsey (Berks). See *Testa de Nevill*, p. 194.

† Pages 254-5.

"62. [p. 90.] Ralph de Moutor disclaims, in favour of the abbey, all right of common in Wollcumb; for such renunciation the abbot granted him the profits of Doniton Mill for one year.

"63. William Paen, of Yarticomb, also disclaims all right of common in Wollcumb, for which he receives one mark from the abbot.

"64. Peter Wood surrenders his land which he held in Yarticomb; viz., in Woolscombe Wood, and received 2s. Roger, vicar of Yarticomb, witnessed this surrender.

"65. Ralph Kuond disclaims all right to common pasture in the waste of Yarticombe, Donnington, and Woolscombe Wood."

Evidently at this time an attempt was being made to reclaim some of the common and waste lands in Yarcombe parish, and the rights of the commoners were being bought up.

From the above four entries we learn, first, that Wollcumb, or Woolscombe, Wood was in Yarcombe parish; then, that for renunciation of a right of common in Wollcumb, a commoner received the profits of Doniton Mill for a year; and lastly, that the waste of Donnington was connected with the waste of Yarcombe, and the waste of Woolscombe. A right of common of pasture in all three belonged to the same person. When we compare these entries with the former statement, that Doniton Mill was one of two mills in which the vicar of Yarcombe had special rights, and with the passage about the archdeacon's fees, in which the chapel of Doniton is mentioned next after the church of Yarcombe, we are led to the conclusion, that Doniton, its mill, and its chapel, were all situate somewhere in Yarcombe parish.

Nor is this quite all that is to be found bearing on the point. In the year 1814, a local Act of Parliament* was passed, affecting the parish of Yarcombe, which accomplished two purposes. The common lands of the parish were allotted and enclosed, and the tithes of the parish were commuted to corn rents in anticipation of the general statute of 1836.

Under this Act of 1814, which recited that Sir Trayton Drake (then Thomas Trayton Fuller Elliot Drake, Esq.) was lord of the manor, and claimed the ownership of the soil in the wastes of the parish, amounting to about 900 acres, these wastes and commons were allotted to the various owners, including the Bishop of Exeter, and the vicar—Sir T. Drake himself being by far the largest proprietor. Twenty acres of Brown Down, and ten acres elsewhere, were set apart for the inhabitants to dig turf and cut furze.

* 54 Geo. III. c. cxc.

The Act further recited that Sir T. Drake was impropiator of the great tithes of the parish, that the king was the patron of the vicarage, and that the vicar, then the Rev. W. Palmer, was entitled to the vicarage house, glebe, and all the small tithes. It then directs that out of the lands not the property of the impropiator, a corn rent should issue in lieu of tithe; also that the vicarial tithes should all be commuted for corn rents; and finally, that out of all the before-mentioned lands, tithes should cease to be paid. The effect was, that in the lands which were the property of the impropiator, the great tithes became merged.

It might have been supposed that this statute would have made a clean sweep, and have effectually disposed of all the tithes of the parish. This, however, was not the case. When the general Tithe Commutation Act of 1836 came into operation, there were still some properties remaining to be dealt with, and an award was drawn up and settled accordingly. This document recites that the rectorial tithes had become merged in the lands belonging to the lay impropiator; that all rectorial tithes in other lands, except those thereafter mentioned, had been commuted to corn rents; and that all the vicarial tithes had been commuted, except those arising out of two grist mills. It then proceeds to state that out of the 4,689a. 2r. 28p., of which the parish consists, 2,000 acres were arable, 2,000 meadow and pasture, 329 orchard and garden, and 360 woods, plantations, and brakes; that over 3,699 acres, mentioned in the first schedule, the great tithes had been commuted; but that there were 573 acres left, consisting of four farms, called Peterhays, Hill House, Blackhall, and New Barn. Why they were left out of the Act of 1814 does not appear. In one instance it seems as if the farm had been recently enclosed. For these tithes a rent of £29 1s. in corn was awarded to the impropiator.

What we are mostly concerned with on this occasion are the two grist mills, in which the vicarial tithes were not commuted in 1814, and for which a commutation of £3 6s. in corn was now made to the vicar. They are called Keats's Mill and Stout Mill.

Keats's Mill stands at an extreme north-east corner of the parish of Yacombe, and of the county of Devon. It is on the river Yart, the eastern boundary of the parish, which stream gives its name to the valley—Æartancumb, Herticome, Yacombe.

Stout Mill stands on a small tributary of the river Otter, which forms the western boundary of the parish. In the

schedule to the award above mentioned, it appears along with an estate called Dennington, containing 82a. 3r. 29p. In the neighbourhood is another farm called Little Dennington. Leading away from the mill towards the east is a lane called Dennington Lane, and a barn and barton now standing bear the same name. They are of quite modern construction. A tradition is preserved of a dwelling-house called Dennington, but of a chapel none, that the writer has been able to hear of.

One cannot fail to be struck with the analogy that there seems to be between the mills of Yarcombe and Donitone, of which the vicar of Yarcombe had the free use in 1260, and these two mills, of which the vicarial tithes were commuted for a rent to the vicar, under the Act of 1836. Keats's Mill seems to identify itself with Herticome or Yarcombe Mill; and Stout Mill, with its adjoining lands of Dennington, seems to identify itself with Donitone Mill.

If the above indications should be deemed convincing, we are then led to this conclusion, that the Herticome of *Domesday* occupied the eastern, and the Donitone of *Domesday* occupied the western, half of the present parish of Yarcombe. The former moiety, in which the church stands, lying on the Yart, would naturally take its name from the river; the latter was named apparently from some possessor of the name of Donne. As to who were the owners in the time of King Edward of St. Michael's lands, the record of *Domesday* is silent; but a Donne is found (fo. 118, 2), as the owner of two manors, which the writer believes may be identified with Newton Poppleford, and Nutswell, and of this person the Commissioners rather pointedly observe: "Hic tenuit de rege Eduuardo, et modo dicit se tenere de Willelmo." It is possible that this Englishman, more fortunate or more diplomatic than others, was permitted to retain Newton and Nutswell, as a compensation for having to give up his own residence, Doniton, to the abbot of St. Michael.

Finally, the size of Yarcombe parish is such as to be not inconsistent with its comprising the two manors of Herticome and Donitone, as a comparison of the acreages will show. Allowing twenty acres for each *Domesday* ploughland, the 1,500 *Domesday* acres of Donitone and the 1,534 *Domesday* acres of Herticome, are well within the 4,000 acres of arable, pasture, and meadow land, which, at the commutation of 1836, were contained in the modern parish of Yarcombe.

AN EXCHEQUER TALLY: A BARNSTAPLE RECORD OF 1622.

BY J. R. CHANTER.

(Read at Totnes, July, 1880.)

IN one of the Barnstaple muniment chests has been found a relic, probably a nearly unique one, of the national system of reckoning and account-keeping in early times, and the foundation of many modern expressions and forms in government and other offices, and in commerce, as well as of words which have been adopted into every-day language, the origin and derivation of which are popularly unknown.

Tallies, generally, have a history, and a very curious one; but as it has ceased to be utilitarian, and has become merely antiquarian, any special reference to them rarely or never appears, except in works professedly of an antiquarian character—the best popular accounts I have met with being an interesting leading article in the *Times* newspaper, in 1834, when the great fire in the Houses of Parliament occurred; also in the *Mirror* for the same year, and in the *Saturday Magazine* of 1842. In fact, to the burning of the enormous accumulation of old Exchequer Tallies stored up at Westminster, the origin and disastrous extent of the conflagration was attributed. They were burnt by order of the Board of Works, although, according to a statement then published, it had been intimated that the public museums throughout the country, and persons curious in such matters, would be glad to purchase some of them for specimens and collections, and it was added, “An old Exchequer Tally will now be a relic of price.” This prophecy has come round. I do not recollect to have seen a similar Tally to this, in any museum, and the exhibition of the present specimen is a main object in contributing this paper. Indeed the form and nature of the

"document," as it may be called, is an incentive to destruction, as it would only present itself to an uninformed mind as a convenient means for lighting or renovating a fire, or as the unused remnant of a faggot, to be swept or thrown away by a tidying attendant; and no doubt the thousands of Tallies which must have been despatched to the provinces, and not again returned into the Exchequer in the form of taxes, have mostly shared that fate. A careful clerk of old, who would be very chary of destroying or injuring his parchments, would have no such compunctions as to bits of coarse wood; hence the preservation, for nearly three centuries, of the example before us is, I expect, rather the result of accident than intention.

The interest attached to this relic is not only general, but local, as illustrating a curious episode in the reign of James I., frequently dwelt on by historians, and which has a special notice in our County Records, at Exeter, to which notice this Tally may be considered a supplement; but before describing it, with its inscription and bearing on local matters, a few preliminary notes appear requisite. The Tallies generally used in the middle ages were of all sizes and descriptions, but the Exchequer Tally was of a special recognized form and pattern, of which drawings are given in the articles before referred to. A rod or wand of hazel wood, roughly squared, on which notches had been cut, was split in two, the cleft passing through the notches; each half would then become the counterpart of the other, as to the number or value of anything the notches signified; and this was in general use, as a system of reckoning and mutual account, not only in government offices, but in all sales or money dealings, before the art of writing became general. The very origin of the name Tally has been disputed, ranging from the Latin "*Talis*," the like, or "*Talea*," a staff, to the French "*Tailler*," to cut or divide, which latter is the generally accepted derivation, this root occurring as the name of the implement in many modern languages; for the system appears to have been universal among Teutonic as well as Latin nations, and was introduced into England by the Normans, after which it became the usual system of keeping and registering accounts, both private and public; one division being left in the hands of each party to a contract. The same idea was subsequently used in certain legal documents on paper or parchment, which were divided into two parts by a wavy or indented line being cut, and thence were termed indentures; and also in the common system of

counterfoils to cheques and receipts, which were said to tally when fitted together.

In private transactions the use of the Tally has long died out, but the name remains in the small dealings of milkmen, publicans, and others; and accounts are still occasionally found kept, in remote agricultural districts, by notches or chalk marks on pieces of wood, and still called Tallies, which also originates the popular designation of a most objectionable class of hawker, the tallyman. But in public matters, especially in the Exchequer, the system survived to a comparatively recent period, having been abolished by Act of Parliament of 23rd George III. Tallies were used not only as simple records of matters of account, but for receipts also, and were issued as the acknowledgment for royal loans, as well as for taxes and other payments, some of which were thence called Tallages, whilst the officers who had charge of the Tallies were called Talliers, afterwards corrupted to "the Tellers of the Exchequer;" and when money had to be borrowed, a Tally was the acknowledgment. Hence the origin of the term "Exchequer Bill," from Bille, billet, a baton, staff, or short piece of wood, on which the Tally was cut; so that it is quite a mistake to suppose that Government bills are a modern invention; they existed for many centuries before the use of paper money, the only difference being that the bills which are now made in paper were formerly made in wood. The Tallies given as security or acknowledgment for loans, were again presentable for taxes, and as late as the 17th century were occasionally circulated as money, and were negotiable in the money market just as the modern Exchequer bills which replaced them. Hence in old newspapers they will sometimes be found quoted among the prices of Stocks. The purport for which the Tally was given was written upon it in duplicate, one half being retained in the Exchequer as evidence of identity, so that it was impossible to forge them; and even now the word is used as a verb, equivalent to matching, when we say that anything tallies with the original.

These are sufficient details for understanding the Tally now before us. It is identical in material, size, and form, with the description and drawing of Exchequer Tallies in the articles before referred to. It is made of hazel wood, twenty-seven inches long, and half-an-inch in diameter, roughly squared, cut across diagonally four inches from the end, half through the rod, and the rest of it cleft lengthways, the half being removed. At the end are a series of notches of

different sizes—nine large and nine small on one side, and three larger ones on the opposite side—the third side having a line of writing with the following inscription, as nearly as can be made out: “D. Rico Beaple maior—ibm coll—p dono. spontan. verss. tutela et defencon Palatinat. hereditar. patrimon predilecti geni potentiss. dni. R Jacobi. ejusdemq geni liborq p Man Laurenc. Ley. Sol Posch V^{to} Sep. an^o R R Jacobi XX^{mo}. S.T. Devon Vill. Barnestaple.”

There is an important appendage to this Tally which I have never seen noticed or referred to elsewhere—a much stouter rod of the same length, but of which one side only is flattened, and some rough notches cut. This is partially fitted to the Tally, and secured by string round them. This was apparently to preserve the Tally and its writing from injury during its transit; in fact, answering the purpose of an envelope of the present day; and on the outside of the cover stick is written the address of Master Rich^d Beaple, Maior in Barnestaple.

The inscription is too contracted and imperfect to ensure a very exact reading; but it may be rendered: “Devon. Villis Barnestaple. De Rico Beaple Maior ibidem. Collectionum pro dono spontaneo versus tutelam et defensionem Palatinatis, hereditum patrimonium predilecti generi, potentissimi domini Regis Jacobi, ejusdem generi, liborque per manus Laurencii Ley. Soluti P. quinto Septembris Anno Regis Jacobi XX^{mo}. Summa totalis 9. 9. 3.”

Or in English: “Devon. Town of Barnstaple. From Richard Beaple, the Mayor there. Collected as a spontaneous gift towards the safety and defence of the Palatinate, the hereditary patrimony of the well-beloved son-in-law of the most powerful Lord King James, and delivered for the use of the same son-in-law by the hands of Lawrence Ley, and paid on the 5th September in the 20th year of the reign of King James. Amount £9 9s. 3d. To Master Richard Beaple, Mayor in Barnstaple.”

The figures are shown by the notches in the Tally.

The purport of this “spontaneous gift” of the people of Barnstaple, as it was called, is shown by the contemporary history of the period. The Princess Elizabeth, daughter of James, had been married in 1613 to the Prince Palatine, who was afterwards elected King of Bohemia; but subsequently deprived of both by the power and machinations of Spain. King James intervened, and attempted to obtain his restoration by embassies, as well as by the more substantial means of money and military aid. The heavy costs attending this

were raised by subsidies, and benevolences, as they were called; that is, direct appeals to the people for money without the authority of Parliament. James took the misfortunes of his son-in-law so much to heart, and his difficulties in raising the sinews of war were so great, as to have pushed his appeals to his subjects for money to a rather unseemly extent; the circumstances attending which, in this county, Mr. Hamilton has recently unearthed from the Records of the Court of Quarter Sessions. One of the documents referring to this benevolence is given in full in Mr. Hamilton's useful and interesting volume, as an instance of the intimidation of public bodies, and of individuals, then attempted by the Crown; and the same, as illustrating our subject, and its local aspect, is transcribed from Mr. Hamilton's book.* I have also appended some entries from *The Diary of Walter Yonge*, of Honiton,† which quite bear out Mr. Hamilton's view as to this benevolence being a high-handed exercise of despotic authority, rather than a spontaneous gift, as set out by the Tally. Anyhow the burgesses of Barnstaple do not appear to have been much intimidated, looking at the small sum remitted by the borough.

COPY—LETTER FROM THE PRIVY COUNCIL.

"After our very hearty commendations—what endeavours his Majesty hath used by Treaty and by all fair and amiable ways to recover the patrimony of his children in Germany, now for the most part withholden from them by force, is not unknown to all his loving subjects, since his Majesty was pleased to communicate unto them in Parliament his whole proceedings in this business. Of which treaty his hopes being at last frustrate, he was enforced to take other resolutions; namely, to recover that by the sword which by other means he saw no likelihood to accomplish. And his Majesty was confident that in a course so nearly concerning him and his children's interest his people in Parliament would have yielded him a liberal and speedy supply. But the same unexpectedly not succeeding, his Majesty is constrained, in a cause of so great necessity, to try the dutiful and forward affections of his loving subjects in another way as his predecessors upon like occasions have done in former times, by propounding a voluntary contribution. And therefore as we doubt not but yourselves will herein readily follow the good and liberal example of such as have been before us, which we may assure you his Majesty will take in very gracious part, so his pleasure is, and we do hereby authorize

* *Quarter Sessions from Queen Elizabeth to Queen Anne.* By A. H. A. Hamilton, 1878, p. 54.

† *Diary of Walter Yonge*, Camden Society, 1848, pp. 50, 53, 56.

and require you with all convenient expedition to call before you all the knights, gentlemen, subsidy men, and all others of known ability within that county, and to move them to join cheerfully in this contribution in some good measure answerable to that yourselves shall and divers others well affected have already done, wherein his Majesty is assured that besides the interest of his children and his own crown the religion professed by his Majesty, and happily flourishing under him in his kingdom (having a great part in the success of this business) will be a special motive to persuade and incite them thereunto. For the better advancement of which service you are upon your first general meeting to divide yourselves in such sort as may best advantage the same and not to call too many to one place at one time, but to take their answers and offers severally calling in the persons unto you one by one. For the collectors we doubt not but you will conceive how requisite it will be to make choice of meet and sufficient persons who are to call for the moneys that shall be given so as the same may be all paid in by the 30th of June next. And so, recommending the service to your best care and endeavours, praying you to return unto us by the 10th of June next, a schedule of the names of such as shall contribute and the sums given by them that his Majesty may take notice of the good inclination of his subjects in a cause of such importance, as likewise of such others (if any be) that out of obstinacy or disaffection shall refuse to contribute herein we bid you hearty farewell.

From Whitehall, 31st March, 1622.

Your very loving friends,

G. Cant.	G. Carew
Jo. Lincoln, C.S.	J. Manderville
Hamilton	Pembroke
H. Falkland	T. Edmonds
T. Arundel	Ju. Caesar
La Winton	Rich. Weston
L. Cranfield	Jo. Suckling
J. Lenox.	

To our very loving friends the High Sheriff and Justices of Peace of the County of Devon.

EXTRACTS FROM DIARY OF WALTER YONGE.

"1622. April. Letters came down this month of April directed to the Sheriff of Devon, for a Benevolence towards the Wars of the Palatinate, with command to deal with the substantial men one by one privately, and to return the names of such as obstinately refuse to give any thing.

"March. There is expected a Benevolence for the Laity—and its said they shall give as much as they are set at subsidy, and as many as shall not pay shall be sent for by the Council and com-

mitted, or be sent in Messages into Ireland or the Palatinate, which will be a benevolence by compulsion.

“There are letters come down from the Council to the justices of peace of this County to deal with all men of sufficiency, one by one to draw them to a Benevolence towards the Palatinate, for the regaining thereof.

“It is said that such as refuse to give towards this Benevolence, either shall be sent into Ireland, or shall go as Soldiers into the Palatinate.”

THE EXMOOR SCOLDING.

BY F. T. ELWORTHY,

Member of Council of the Philological Society.

(Read at Totnes, July, 1880.)

AT this Society's meeting in 1866, the late Sir John Bowring referred to the *Exmoor Scolding and Courtship*, and made the positive statement that their authors were Andrew Brice and Benjamin Bowring. It would have been satisfactory if Sir John had given any scrap of evidence, either of written document or family tradition; but notwithstanding the great weight to be attached to any direct statement from so eminent a man, yet it cannot be accepted in opposition to that of a no less eminent man—Sir Frederick Madden—who has brought a good deal of evidence to support the assertion which he makes. Sir F. Madden believed the two dialogues to have been written by the Rev. William Hole, who was archdeacon of Barnstaple from 1744 to his death in 1791. It is quite certain that a preface was issued with the seventh edition, published at Exeter in 1771, and reproduced with all subsequent editions. In this preface, issued during the lifetime of Archdeacon Hole, we are told distinctly that the writer was a "neighbouring clergyman," who got his matter from the lips of one Peter Lock, a blind fiddler of North Molton. There is much internal evidence to be found in the dialogues themselves, which would strongly confirm this statement, and would fully account for the original writer's asking for explanations of many words and idioms which he himself had penned.

These well-known Devonshire specimens (which may now be bought in about a 50th edition, at the bookstalls, for sixpence), as Professor Skeat well says, "notwithstanding certain faults, possess a permanent philological interest; particularly in the number of words and grammatical forms

which, though common in English of a much earlier date, are now obsolete in literary English, but are preserved in these dialogues, and are still living in the spoken dialect."

From this point of view the *Exmoor Scolding and Courtship* are a very important link in the chain which carries back our present West-country speech and pronunciation to certainly within two, probably to within one century of the Norman Conquest. In one point at least, they preserve the form *ch*, of the first person singular, which is little different from that used by our Saxon ancestors, and which can be traced century by century through all the writers of southern English since Alfred's time.

In the mediæval writers, this form was spelt and most likely sounded like modern low German *ich*; but before Shakspeare's time it had lost its vowel, and accordingly we find him make his Edgar, in *Lear*, when he wishes to put on a clownish disguise, say *ch'am* for *I am*. This form was the common one in the south, certainly 150 years before Shakspeare, as it occurs all through a poem called the *Chronicon Vilodunense*, a legendary life of Saint Editha, written in 1420. Moreover, it is used throughout the *Scolding and Courtship*, in neither of which, so far as I remember, is the modern *I* to be found. It is curious that a form, evidently quite common in North Devon 150 years ago, and which is still used in one part of Somerset near Ham Hill, should now be entirely obsolete and forgotten in Devonshire. I cannot find, after most diligent enquiry, any person in North Devon who has ever heard of the *ch* being so used. I venture to urge further enquiry among those members of this Society who may have the opportunity, so that the interesting point as to when this ancient form became lost may be cleared up.

These dialogues in many other particulars, give ample evidence of the short time in which words may drop out of use and be quite forgotten, while the idiomatic forms of speech in which they once formed a part, remain unchanged.

Although first published less than 150 years ago, few, even Devonshire men, could read them now, for the first time, without much puzzling as to the meaning of a vast number of the words.

Of many, I have failed signally and finally to find out what is the meaning, although I have sought amongst those who have all their lives been familiar with the district. This applies especially to those words only, which no more than a hundred years ago, were then so familiar as not to be thought to need a place among those explained in the vocabulary. We see

that even then a glossary was felt to be necessary; for, of course, many of the words were never common, and outside of their own district must have been then, as now, utter gibberish.

One of the main characteristics of Devonshire English is the usual retention of the old verbal inflection *th*, as *he knows* = Devonshire, *a nawth*; *they know* = Devonshire, *they nawth*.

Prince Lucien Bonaparte places this as the distinctive feature of Devonshire, as compared with its kindred dialect of Somerset. In the latter, the usual mode is the periphrastic, as *her do naw*, *her do walky*, while in Devon it would be, *her walkth*. I venture to differ from the Prince upon this point, because the *th* form is common in Somerset, though less so than in Devon. We all are familiar with this *th* inflection in Scripture, yet in our authorised version we only find it with a singular construction. Long before the seventeenth century, it ceased to be used with plural nominatives, but in Devonshire it would still be said, "*They lambs growth, ees fath! they doth*;" and in the *Ancren Riwele*, written about 1220, we read *alse sum deþ*; *alse 3e telleþ me*; and many more examples of this plural construction might be quoted. Here, however it should be noted that *doeth* is spelt *deþ*, both in the *Ancren Riwele* and the *Exmoor Scolding*, and was doubtless pronounced *deth* precisely like our modern Devonshire.

We are all familiar with the West-country use of *to*, when polite people say *of* and *at*. As in "*Farmer Green to Combe Martin, bide about to market, haun better fit, a'd be aum to Whitstones*." Compare this with Robert of Gloucester, who wrote of William the Conqueror in 1300:

"þre siþe he ber croune aþer, ·
to Midewinter, to Witesonetid,
to Ester."

Again, the form *a be* in the above example is, we all know, used in Devon, for the past participle, when polite people say *been*. In the *Scolding* we read, "*Es dedent thenk tha hadst a be rich a Labb o' tha Tongue*." The same form is found in old writers, usually spelt *ibe*, back to the thirteenth century. Robert of Gloucester wrote—

"Moche aþ þe sorwe ibe
Of moni bataile þat aþ ibe."

In like manner we West-country folks should say, "*They be all ago*," "*Her dude her work very well*," "*Your two-bill id'n*

ado," while the "ginlvokes" would say, "*They are all gone*," "*She did her work very well*," "*Your mattock is not done*." Let us see who is right, or, at least, who is supported by the oldest writers.

In the *Chronicon Vilodunense*, 1420, we read :

"þis ʒong chyld þo, þ^t by hurr did stond,
anoñ vanysshede away and was ago."*

"Bot when Edwyge was þus ago." †

Again, "Bot when þe mass was all ydoe." ‡

So also John of Trevisa wrote, 1387 :

"Vor he hadde ydo an unkunynge dede."

Mark the *vor* in this example.

Still earlier Robert of Gloucester says of William the Conqueror :

"As þe hende he *dude* verst, §
& þoʒte on þe grete op þat he hine adde er ydo."

Similar specimens of *be*, *do*, and *go* might be multiplied indefinitely if needful, but those given are enough for the purpose.

In this county the infinitive of purpose is still almost invariably preceded by the preposition *for*, as "*Us tried vor to gi'n*," "*A did-n go vor to do it*." This would now be called provincial by some, bad grammar by others ; yet the form is found in all the old writers, down to, and including, our authorized version of the Scriptures. "What went ye out into the wilderness *for* to see? A reed shaken with the wind? But what went ye out *for* to see?" ||

The verb *to come* in received English has its past tense *came* ; but in our dialect it is *come* or *com*, as "*Hon us come up to the station, us vound that the train was agoo*."

Compare this with the aforesaid *Chronicon* :

"To Wylton anō þo come he ywys." ¶

Further back Robert of Brunne, A.D. 1303, who, however, wrote Midland English, says :

"One come with an asse charged with brede." **

Robert of Gloucester says :

"Frut & Corn þer failede . tempestes þer come." ††

* St. 380. † St. 194. ‡ St. 73. § Lines 13, 15.

|| St. 351. ¶ Handlyng Synne, l. 5806.

** Luke vii. 24 ; Matt. xi. 7. †† William the Conqueror, l. 439.

In the *Exmoor Scolding* *tho'* is used for *then* as an adverb of time, as it still is in Devon and Somerset. We shall see this is no modern corruption of pure English. Throughout the *Chronicon Vilodunense* this word is written *þo*, or *yo*, or *yoo*, generally the former. *Then*, as an adverb of time, is not to be found in the entire poem. Speaking of King Egbert, it says:

“Bot whē he had brouȝt þo four Kindam^s to hepe
and won the Cyte of Chest^s also
He comandede all men to clepe
All his lond England þo.”*

Robert of Gloucester says:

“& Richard þat was þo a child.”

The same word is found in the *Ancren Riwe*.

It would be easy to adduce almost numberless examples from the old writers of grammatical constructions, which are now considered barbarisms of dialect. One of our most remarkable pieces of conservatism is the regular retention of the prefix to the past participle in all verbs. This, which is invariable in the dialect of the West Country, is completely dropped in the courtly English, and had mostly become obsolete in Shakspeare's time, while I believe it is retained in none of the other dialects of England. So far from its becoming obsolete with us, I should judge from the *Exmoor Scolding* that it is even more rare now to hear it omitted, than it was a hundred years ago; that is supposing the dialogue to be a faithful specimen of the Devonshire of the last century. We find in the *Scolding* examples of the modern literary omission of the inflexion, where at present no native would ever omit it. As (l. 251) “*Absleutly tha art bygaged*” should be *a bygaged*; again (l. 277), “*tha wet be mickled and a stev'd wi' tha cold*,” this should be *a mickled*; the transcriber has not omitted the inflexion in *a steved*. The pronunciation of this inflexion has probably hardly altered at all in the last six or seven centuries. We find it written *ibe*, *ydo*, *ybroȝt*, *ibroke*, *icome*, *y wryton*; and these would doubtless have the same short *u* sound, which is given them in the dialect; precisely the same as the short *e* in “*thē book*,” just that of all short unaccented vowels before *r*, or, as it is called, the *natural vowel*.

Another feature of this and of all dialects is the nicety, the almost invariable accuracy, with which the words are pronounced and used, according, of course, to the dialect

* St. 22.

standard. This is particularly the case with *f* and *v*, *s* and *z*. The certain test of a writer's real acquaintance with western dialect is his use of these consonants. In speaking, a native never confounds them. His lips would not form *vamily*, or *vashion*, or *zarvant*, or *zea*. The latter word would be a verb—*zay*. So *zoul* would mean a *plough* and not *spiritus*. *Full* when joined to an abstract noun transforms it to an adjective, as *dreadful*, *hurtful*, &c. It is *vull* when added to a common noun, and then makes it a measure, as *armvul*, *hatvul*, *pocketvul*. In polite English this *full*, in both cases, has precisely the same sound, but in the dialect the difference is very carefully marked by the pronunciation, *dreadful*, *harmful*, *armvul*, *pocketvul*.

No greater mistake has been made than in the assertion, that we are too indolent and slow to take the trouble to pronounce the sharp sounds of *f* and *s* correctly. The fact is that no *West-country* man ever says *zarvant* or *zarpent*, nor does he ever say *varrier* or *vancy* or *vacket* (faggot), and, moreover, he has a very sharp and unerringly clear ear for those particular sounds of *f* and *s*, which, I repeat, so far as my experience goes he never confounds. Old English words which the modern fashion initials with *f* and *s*, such as *fire* and *sister*, will in Devonshire be pronounced *vire*, *zister*; while French words with the like initials, as *ferret*, *satin*, will invariably be pronounced as sharply *f* and *s* as by a real Parisian.

The old southern writers, as we have already seen, wrote *vor*; they also wrote *vorth*, *vour*, *vifte*, *vair*, *vast*, *veld* (field), *vond* (found), &c.; and although the difference between *s* and *z* was perhaps not very strongly marked, yet we find *zang*, *zay*, *zenne* (sin), *zette* (set), *ziþe* (sight), *zittle*, *zone*, *zorþe* (sorrow), *zostren* (sisters), *zuo* (so), *zuord*, *zuche*, *zuyfte* (swift), *zyke* (sick), &c.

These samples of the language of 500 years ago, and which, if time permitted, might be produced to any extent, show very clearly that in many respects the *Exmoor Scolding* is classic; that we in the West are not corrupters of our native tongue as it is the fashion to brand us. They show that we are the true conservators of the true Old English, and that the clever people who laugh at us, and say that we put *v* for *f*, and *z* for *s*, are just they who need just a little more knowledge themselves. Those too, who write funny things in provincial English should be very careful observers, and note well that the conservatism of local pronunciation is just as trustworthy as regards imported words as with those of native growth.

Spelling in the olden time was less uncertain as a key to sound than it is at present. Especially is this true as regards words spelt *ough*; for instance, *though* of literary English is *thof* in the modern dialect, in the *Exmoor Scolding*, and in Old English.

In concluding this mere sketch, I may venture to hint to those who are taking an interest in and working upon dialects, that careful observation and record of the pronunciation, accent or stress, together with the grammatical construction, such as conjugation of verbs, use of prepositions, adverbs and conjunctions, will, in the end, be of still more value than the collection of words fast becoming obsolete.

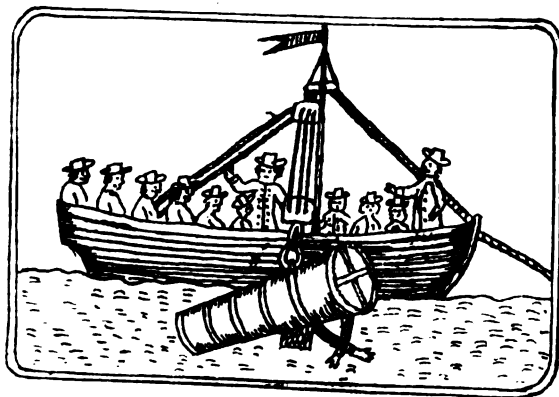
JOHN LETHBRIDGE AND HIS DIVING-MACHINE.

BY JOHN S. AMERY.

(Read at Totnes, July, 1880).

IN May, 1879, Mr. W. Nosworthy, of Manaton, a member of this Association, invited my brother and myself to his house to examine some coins which had recently been found in the roof of an old building close by, of which Mr. Pengelly gives us an account. Whilst at his house Mr. Nosworthy showed us a very fine silver tankard, apparently a whistle tankard, which had been in his family for several generations. This tankard, which would probably hold about three pints, had two very curious engravings on it, and between them a coat of arms. On the one side the engraving represented an island with a town on it, and the words PORTO SANTO ISLAND, LAT. 33 N. LONG. 5; and on the other side was a barge on the sea full of men, from which was being raised or lowered a large conical object, at first sight not unlike a large cannon. On the handle were the following initials, ^L_{IE}. During the last century it was usual to place initials in this way, the single letter on the top being the initial of the surname, and the letters below those of the Christian names of the man and his wife. Mr. Nosworthy had been unable to get any clue to the meaning of these engravings, nor did he know to whom the initials referred. Having heel-ball and suitable paper with me, I was enabled to take some rubbings. Referring to my heraldic index I found that the arms—viz., a bridge of three arches turreted, in chief an eagle displayed—probably belonged to a Lethbridge; this was further supported by the letter L in the initials.

After several fruitless enquiries and searches for persons of



the name of Lethbridge, I one day found the following in Lysons' *Devon*,* under the head of Wolborough :

"At this place lived Mr. John Lethbridge, not so well known as he deserves to be, as the ingenious inventor of a diving-machine, by which he was enabled to recover goods from wrecks at the bottom of the sea, without any communication of air from above." Porto Santo was also mentioned as one of the places where he had dived on wrecks. From this I was convinced that I had found my man, and that the curious object engraved on the tankard was his diving-machine. Thinking an account of him might be interesting, I shall give all the particulars that I have been able to gather about him.

It appears that a Mr. Symons, of Harberton, near Totnes, claimed to have invented a diving-machine, and in a letter written by a Mr. Ley, to the *Gentleman's Magazine*, July, 1749, accused Mr. Lethbridge of robbing him of his invention; thereupon Mr. Lethbridge writes to the same magazine denying the accusation, and giving a full account of his own invention. If it had not been for these letters we should probably have lost all traces of its history. Mr. R. Dymond having with his usual kindness copied the longest of these letters for me from the *Gentleman's Magazine*, I am enabled to give them in full.

"A DESCRIPTION OF A DIVING-SHIP MADE SOME YEARS SINCE BY
NATHANIEL SYMONS, OF HARBERTON, NEAR TOTNES.

"Mr. Symons was a common house carpenter, of Harberton, who invented a diving-boat as follows : 'Though I did not see it I shall trouble you with such a description as my memory will permit, after so long a time as twenty years, and which I had from the inventor himself.

"'He made his boat in two parts, and joined them in the middle very tight with leather, that no water could get in; he made a false door in the side, which, when he was in, shut very tight; and though his going in admitted a small quantity of water, it was no inconvenience. After this outer door was shut he opened the inner one to get into his boat.

"'There was more than fourscore weight of lead to the bottom of his boat (but this I presume must be according to the dimensions of the boat). Though the boat would swim when extended to its full dimensions, yet he had a screw to each side of his boat, which, when within it, he could manage himself, and which, by means of the leather that joined the parts of the boat, contracted them to that degree that the boat would sink.

* Vol. ii., p. 568.

“He went into the middle of the river Dart, entered his boat by himself in sight of hundreds of spectators, sunk his boat himself, and tarried three-quarters of an hour at the bottom; and then by extending it with his screws he raised it to the surface again without any assistance. He said that though at last the air began to be thick he could bear it very well.

“This same person invented the famous diving-engine for taking up of wrecks, though his cousin L——e deprived him of both the honour and profit.

“And though a great number of gentlemen of worth were present at shewing his boat, he told me he received but one crown piece from them all. I think he has been dead some years.

“If any of your correspondents can make any improvement from this imperfect account I shall be very glad, who am with all sincerity.*

“Yours, &c.,

“SAMUEL LEY.

“LAMORRAN, *July 17th, 1749.*”

“MR. URBAN,—Having observed in your magazine for July, p. 312, a description given by Mr. *Samuel Ley*, of *Lamorran* (to whose person and residence I am an entire stranger), of a diving-boat, invented some years since by Mr. *Nathaniel Symons*, of *Harberton*, near *Totness*, in *Devon*, a house carpenter; and Mr. *Ley* having asserted that Mr. *Symons* invented the famous diving-engine for taking up wrecks, though his cousin, L——e, and some others, deprived him both of the honour and profit; and as I am the first inventor of a diving-engine in *England*, without communication of air from above, I therefore presume Mr. *Ley* means me, under the title of Mr. *Symons* cousin L——e (to which kindred I have not the least pretension). Now, whether the assertion proceeds from prejudice, or false information, I will not determine; but whatever may be the motive, I think it incumbent on me to give an answer thereto, which shall be genuine. And, first, as to the diving-boat insisted on I shall say nothing of it, having never seen it, nor ever heard that it was anywise serviceable, but readily agree with Mr. *Ley*, that his account of it is imperfect; and as to the famous diving-engine, which Mr. *Ley* is pleased to say was invented by Mr. *Symons*, I take the liberty to aver it is my own invention. It is observable that Mr. *Ley* is silent with respect to its description; but as it hath been of such singular service to the public I shall here insert a particular description thereof, with the principal motive of the invention. Necessity is the parent of invention, and being in the year 1715 quite reduced, and having a large family, my thoughts turned upon some extraordinary method to retrieve my misfortunes, and was prepossessed that it might be practicable to contrive a machine to recover wrecks lost in the sea; and the first step I took towards it was going into a

* *Gentleman's Magazine*, 1749, vol. xix. p. 312.

hogshead, upon land, bung'd up tight, where I stay'd half-an-hour without communication of air; then I made a trench, near a well, at the bottom of my orchard in this place in order to convey a sufficient quantity of water to cover the hogshead, and then try'd how long I could live under water without air-pipes or communication of air, and found I could stay longer under water than upon land. This experiment being try'd, I then began to think of making my engine, which was soon made by a cooper in *Stanhope Street, London*, of which you have the following description: 'It is made of wainscot perfectly round, about six feet in length, about two foot and a half diameter at the head, and about eighteen inches diameter at the foot, and contains about thirty gallons; it is hoop'd with iron hoops without and within to guard against pressure. There are two holes for the arms, and a glass about four inches diameter, and an inch and a quarter thick to look thro', which is fixed in the bottom part, so as to be in a direct line with the eye, two air-holes upon the upper part, into one of which air is conveyed by a pair of bellows, both which are stop't with plugs immediately before going down to the bottom. At the foot part there's a hole to let out water. Sometimes there's a large rope fixed to the back or upper part, by which it's let down, and there's a little line called the signal line, by which the people above are directed what to do, and under is fix'd a piece of timber as a guard for the glass. I go in with my feet foremost, and when my arms are got thro' the holes, then the head is put on, which is fastened with screws. It requires 500 weight to sink it, and take but 15 pound weight from it and it will buoy upon the surface of the water. I lie straight upon my breast all the time I am in the engine, which hath many times been more than six hours, being frequently refreshed upon the surface by a pair of bellows. I can move it about 12 foot square at the bottom, where I have stayed many times 34 minutes. I have been ten fathoms deep many a hundred times, and have been 12 fathom, but with great difficulty.' With this I dived 3 years before I saw Mr. *Symons* I solemnly declare, and I think I never heard of such a man till he came to the *Lizard* to see my engine, which he liked so well that he desired to adventure with me on some wrecks near *Plymouth*, where we adventured together without success. Sometime after this Mr. *Symons* reported, behind my back (but I declare never to my face), that he was the inventor of my engine; but I protest I never saw a diving-engine before I saw my own, nor did I ever see Mr. *Symons's* diving-boat (as Mr. *Ley* calls it), nor ever saw him dive in an engine in my life, of all which I am ready to make and avir. As I have given a clear and just answer to the assertion, and offered to support it as strongly as any reasonable man can expect, I must, therefore, beg leave to observe the improbability of my stealing an invention from another man (and if Mr. *Ley* says true it is nothing less); for a man must be little otherwise than

mad to try an experiment in a hogshead the very day and hour of the great eclipse in 1715, in order to contrive an engine of which he was master before. Now, this experiment in the hogshead is no fiction; for the person who assisted me dyed but three years since, and I appeal to his children now living here, and my well-disposed neighbours in general for the truth of it. I can't conclude without remarking the absurdity of the assertion—I mean of taking away the honour and profit. Now, for argument's sake, suppose I had taken the dimensions of Mr. Symons's engine, and make one like his, as is alleged, would that have stopped his progress? Would he not (like an Englishman) have asserted his right, and proved me an imposter? Might he not have dived in the *West Indies*, at the Isle of *May*, at *Porto Santo* (near Madera), and at the *Cape of Good Hope*, as well as myself. But perhaps a stranger to him may object that he wanted either money or friends, to which I answer that he wanted for neither; and as for myself, in the beginning of my project, no man ever wanted for more of both. I could (if necessary) quote many gentlemen of considerable rank in this kingdom and *Holland* who are well acquainted with my capacity and veracity in this respect.

"I am Sir Yours, &c.,

"JOHN LETHBRIDGE.

"Newton Abbot, near Exon, Devon, September 19th, 1749.

"P.S.—I would not be misunderstood in saying that I am the first inventor of a diving-engine without communication of air, for I mean such as to work about in so small a quantity of confined air; for otherwise I should assume the invention of a diving-bell engine (to assist naked divers), invented by Sir *Wm. Phips* in the reign of King Charles II., which was improved by Dr. *Halley*, who frequently conversed with me on account of my invention, and said he never thought any man could invent a machine to work about himself in so small a quantity as six ounces of confined air."*

After Mr. Lethbridge had completed his machine he appears to have offered his services to some London merchants to adventure on the wrecks of some treasure ships then lately lost; but it was some time before he found any who had sufficient confidence in the success of his experiments to offer him terms at all adequate to his deserts and expectations; but after his success had been proved, he was employed to dive on wrecks in various parts of the world, both for his own countrymen and for the Dutch and the Spaniards.

At the house of his grandson, John Lethbridge, at Newton,

* *Gentleman's Magazine*, vol. xix. (1749) p. 411. Compare *Lysons' Correspondence*, Add. MSS., No. 9428, pp. 353-357, Brit. Mus.

was a board, on which was an inscription, in gold letters, dated 1736, stating that John Lethbridge, by the blessing of God, had dived on the wrecks of four English men-of-war, one English East Indiaman, two Dutch men-of-war, five Dutch East Indiamen, two Spanish galleons, and two London galleys, all lost in the space of twenty years; on many of them with good success, but that he had been very near drowning in the engine five times. The apparatus, about the year 1800, was said to be at Governor Holdsworth's, at Dartmouth, but in a decaying state.

Mr. Lethbridge is thus noticed in the register of the parish of Wolborough: "December 11th, 1759. Buried Mr. John Lethbridge, inventor of a most famous diving-engine, by which he recovered from the bottom of the sea, in different parts of the globe, almost £100,000 for the English and Dutch merchants which had been lost by shipwreck."

It is said his most laudable endeavours were so far crowned with success that he was enabled not only to maintain his family, but to purchase the estate of Odicknoll, in the parish of Kingskerswill.

There is reason to believe that Mr. Lethbridge was the first person who, by his ingenuity and intrepidity, succeeded in recovering goods from wrecked vessels. Though Phipps' diving-bell was a prior invention, there is no record of its having been successfully used for practical purposes.

In the same year, 1715, that Mr. Lethbridge invented his machine, the following account of another sort of diving-engine appeared in the *Exeter Mercury; or, Weekly Intelligence of News*, 2nd September, 1715. (From the column of London Intelligence, dated 30th August):

"Yesterday in the Afternoon his Majesty (*Geo. I.*) the Prince and Princess &c. went to take the Air in their Barge; during which an Experiment was made of a Diving-Engine of a new Invention in which a man walked at the Bottom of the River from Whitehall almost to Somerset House, being under water three Quarters of an Hour. This Engine is said to be invented by one Major Becker and they say it's the best of the kind that ever was heard of. It was made of Leather with Glass Eyes in such a manner as the use of his Hands and Feet were entirely preserved. For Conveniency of air a long Pipe was fixed from the Engine to a Vessel, and at the top of the Pipe was a Man planted, who by that Contrivance could discourse with the Diver the whole Time."

To again return to the subject of the tankard. The date of it from the plate mark appears to be 1676, many years before

the invention of the machine, and I should therefore be inclined to think it is very probable that this tankard, amongst other valuables, had been recovered by Lethbridge from some wreck at Porto Santo; that he had received it in perhaps part payment for his services, and so had a sketch of both the island and the machine engraved on it; and thus it has now been the means of awakening fresh interest and enquiries on the subject.

In conclusion, I wish to acknowledge my thanks to Mr. Nosworthy for allowing me to exhibit this valuable and interesting tankard to this Association.

A TOTNES SCHOLAR: EDWARD LYE, M.A.

BY EDWARD WINDEATT.

(Read at Totnes, July, 1880.)

IT is not often that a small town can boast of producing men who have taken high rank in different departments of Science, Literature, and Art; but Totnes can point with pride to the fact that Kennicott, the great Hebrew scholar; Brockedon, the painter, writer, and inventor; and Edward Lye, the learned Anglo-Saxon scholar, were born within its boundaries.

At former meetings I have brought before the notice of the members of this Association slight sketches of the two former of these Totnes worthies, and I now propose to give a few particulars respecting the third; and it seems to me most appropriate to do so at a Totnes meeting.

It must not be supposed, however, that these three are the only native celebrities Totnes can boast; in fact, Lye's great-great-grandfather, Sir Edmund Lye, Knight, who had strange adventures in the west with the Spaniards, and harassed them much, and who fitted out at his own expense two vessels against the Spanish Armada, lived and died in Totnes, and is claimed as a Totnes as well as a Devonshire celebrity.

After Sir Edmund left the seas, he settled down quietly in Totnes as a brewer, and on his death, in 1625, his sons continued to carry on the business; but inheriting their father's warlike desires, they sold their brewery to assist in raising troops for Charles I., and thus ruined their fortunes.

The great-grandson of the old knight was a Totnes school-master, and his son Edward was born at Totnes in 1694 (some authorities say 1704, but this is incorrect). Having received his early education from his father, to whose teaching he was no discredit, he at the age of 19 was admitted a student of Hart Hall, now Hertford College, Oxford, and took his B.A.

degree in 1716; was ordained deacon in 1717, and priest in 1719, and was presented to the living of Houghton Parva, in Northamptonshire.

As a young man he seems to have been very delicate, but must in early years have devoted himself to study, and thus laid the foundation of his future position as a man of learning.

At the time of his presentation to the living of Houghton Parva, or soon after, Lye's father died, and he had to maintain his mother and two sisters.

In 1722 he took his M.A. degree.

In the quiet of his country parsonage he employed his spare time in the study of the Anglo-Saxon language, and it was his profound acquaintance with the manners and language of our Anglo-Saxon ancestors, which he has illustrated with such unequalled ability, that obtained for him a foremost place among antiquaries and linguists, and which makes Devon and Totnes remember him with just pride.

His first literary work was an edition of the *Etymologicum Anglicanum* of Francis Junius, from the author's manuscript in the Bodleian Library. This work occupied seven years, and was published in 1743. It was enriched with original notes, and a new grammar of the language. This was so favourably received by the learned that in 1750 he was made a member of the Society of Antiquaries, and the Earl of Northampton about the same time presented him to the living of Yardley Hastings, upon which he resigned the living of Houghton Parva: notwithstanding he had still to support his mother and sisters, he would not be a pluralist.

Lye's second work was undertaken at the request and desire of Benzelius, Archbishop of Upsal, and was a translation of Ulphilas' version of the evangelists, a curious Gothic version of a portion of the New Testament, which he published in 1750. He preceded it with a grammar of the Gothic language. Benzelius had himself collected and collated these gospels, hence his desire that Lye, who had by his former work shown his fitness for the task, should translate them; and this work increased the estimation in which he was held as an Anglo-Saxon scholar by the learned.

For many years he entertained the idea of publishing an Anglo-Saxon and Gothic dictionary, and had worked at it; but on account of the great labour and expense such a work entailed, he very nearly relinquished his design. Archbishop Secker, however, offered him a subscription of £50 towards

the cost of the work, and he seems to have supposed he should receive similar support; but it does not appear that his supposition was fulfilled. As he had no one to share the labour with him (and he appears to have been a delicate man), it seems wonderful that he should have succeeded; nothing but untiring perseverance and a love for his work could have enabled him to carry it, as he did, to a successful issue. The last few years of his life were employed in completing the work; but just as the MS. was completed and in the printer's hands, he died at Yardley Hastings, his death taking place on 16th August, 1767, and his remains rest there.

In 1772 his dictionary was published, in two volumes, folio, by Rev. Owen Manning, with a grammar of the two languages united, and a memoir of the author in Latin, written by Mr. Manning. Its title was *Dictionarium Saxonico et Gothico-Latinum, auctore Edwardo Lye, edidit et Auxit O. M.* It was a grand work, of which Totnes and the county may well be proud; for it would take a high position if it had only aimed to be a compilation; but it has far higher merit, having not only diffused a taste for this interesting department of national history, but given a great impulse to Philology.

After leaving Devon there is no record that Lye kept up his connection with the county, and this is borne out by the fact that Dean Miller was the only Devonian in the list of subscribers to his great work. It was at Lye's dying request that his friend, Mr. Manning, undertook the work of editing and seeing through the press the dictionary, only thirty sheets of which had been printed when Lye died. To this work was added some fragments of the Ulphilian version and other pieces in Anglo-Saxon, and a grammar of both languages was prefixed.

Manning was vicar of Godalming and rector of Pepper Ham, both in Surrey. He completed and published Lye's work in 1772. He was himself a man of learning and an antiquary, and on his death, 9th September, 1801, left behind him a large collection towards the topographical history of Surrey. He died in the 80th year of his age.

Lye's appears to have been an uneventful life; but, considering his learning and research, and the debt of gratitude men of learning owe him, it is, I think, but right that his name should not simply appear in our list of Devonshire celebrities,

but that these few particulars of his life shall be placed on record amongst the *Transactions of the Devonshire Association*, so that should a second John Prince arise to write of Devon's worthies, he may give a place to Edward Lye, the learned Anglo-Saxon scholar.

THE FAUNA OF DEVON.

HYMENOPTERA.

SECTION ACULEATA.

BY EDWARD PARFITT.

(Read at Totnes, July, 1890.)

THE insects included in this section are regarded by naturalists as the most remarkable for their economy and modes of life. Many of them come nearer to man perhaps, in the constructions of their dwellings, than any others of the invertebrate class. There are amongst them carpenters, masons, paper-makers, upholsterers, tapestry-makers, agriculturists, cow-keepers and dairy-maids, and engineers more wonderful than those who have perforated the great tunnel of Mont Cenis or St. Gothard. Indeed, there is scarcely a branch of human industry which may not be found practised by this group of insects; at the same time they are the greatest puzzles to the anatomist and philosopher; for, as a rule, these ascribe the highest intellects to those who possess the highest developed brain, not the largest, as was at one time supposed, but that of the highest quality. In the whole group of Hymenoptera no brain proper has ever been discovered, and yet they exhibit intellectual actions almost equal to man himself. "Instinct," as defined to us, is not sufficient to account for the wonderful knowledge displayed by these insects.

We read in the Geological Record, that the insects of this order were introduced upon the scene coincident with the flowering plants—plants to which the bees and their allies are especially attached, and (as has now been especially ascertained by Mr. Darwin) the continuity of which entirely depends upon their assistance, so that in this instance the animal and the vegetable kingdoms are dependent upon each

other. The one provides the food, and the other conveys the life-giving powers of fertilization and the continuity of life. We can then, from this point of view, see the reason of their simultaneous appearance upon the world's great stage.

Only one flowering plant, so far as is at present known, preceded the introduction of the Hymenoptera; namely, *Pothocetes Grantonii*, of the Coal Measures; but we have no proof of any insect of the order Hymenoptera until we arrive at the Lias of Schambelen, in the Swiss Alps, where Professor Heer discovered a fossil wing of what he believed was an insect of this group.

It is not, however, until we reach the Tertiary period that the Hymenoptera begin to appear in abundance, and to be generally distributed. This is quite consistent with the flora of that period, for here appear the Oaks and Myrtles, Walnuts, Figs, and the great honey-distilling plants, the Proteacea—plants now confined to the Cape of Good Hope and Australia. Herein, then, we see the beautiful adaptation of Nature's means to certain ends. While the creature is obtaining food from the plant, it is at the same time assisting Nature in her work of fertilization and the continuity of life, which appear to be the sole end and aim of both kingdoms, the vegetable and animal. The Hymenoptera, as a rule, are children of the sun. The warmer and brighter it is the more they delight in it, and without it they die, or are rendered inactive or torpid. One of the earliest to appear in spring, as soon as the sun begins to warm the atmosphere and the early spring flowers open to his rays, is a species called *Anthophora acervorum*. The males, as in all the species of wild bees in this country, appear first, and in this the male generally appears several days before the female.

Eighteen years ago I observed that a pair of this species had taken up their quarters in the cob-wall of a stable which abuts upon my garden. I noted in our meteorological register the date of their appearance, and have each year done the same, and by going over these notes, with the temperature, at the time of their appearance, I find that it requires a mean of about 50 degrees to develop these from the pupæ to the perfect insects. Thus in February, 1863, the mean temperature for that month was 50, and the male bee appeared on the 3rd March. In 1864 it did not put in an appearance until the 19th of March, and in 1865 the male did not come out till 2nd April, the mean temperature for March being only 44·9 degrees. Thus you will observe that a bee may, by watching, be turned to account in the absence of a thermometer, as I

presume this species is regulated by the same degrees of warmth wherever it is found.

These creatures being such lovers of warmth and brilliant sunshine, judging from what we know of their habits and their requirements in life, we are by this means enabled to judge of the state of the atmosphere and the temperature of the world at the period of their introduction.

Of the over 200 species of bees indigenous to this country known at the present time, none store up honey. Although they live chiefly upon the nectar secreted by flowers, yet they do not store it like the hive bee, *Apis mellifica*; but they feed their larvæ or young on a kind of bee-bread, composed of honey and pollen. Some years ago I discovered a colony of a small bee, *Chelostoma florisomne*, in the thatch of a cart-shed. There were perhaps some hundreds of them. They were busy at work carrying in pollen collected in the garden close by. On drawing out some of the straws, I found they were hermetically sealed up, and to make doubly sure of their eggs or progeny, thither the bees had brought bits of gravel or small stones and literally paved up the ends of the straws so that no intruder could get in. I pulled out several of these straws and split off a piece so as to lay the whole interior bare, and then I found that near a knot of the straw was the beginning of the nest; and there was placed some pollen. On this was laid an egg; then there was a little space left, and round this more pollen. When sufficient was collected in this place for the young larvæ to feed on up to its full development, a thin diaphragm was placed across the straw; then another egg and more pollen, and so on until the straw was filled. In some I found pupæ, the young bees almost ready to eat through the semi-transparent skin with which they were each enveloped; of the pollen masses which had been laid up for them while in the larvæ state, very little was left. There appeared some difficulty for the young bees to cut their way through the paved-up end of the straw; but I found that behind this pavement the pollen could be cut away from within, and so the pavement of stones would naturally fall down, and the little creatures could then escape. This little bee, as its specific name denotes, may be frequently found sleeping in flowers as evening comes on; and it has also another peculiarity, in which, so far as I am aware, it is unique among our native insects. This species have sometimes a very odd way of going to sleep, by attaching themselves by their mandibles, to twigs of trees or bushes, and there hanging in rows as if they were strung up on a string. In a letter I have before me of

the late Mr. F. Smith to the Rev. J. Hellins, Mr. S. has given a sketch of such a scene.

In all cases, I believe, amongst the indigenous bees, the eggs which produce males are the last that are deposited, and they are the first that are developed, and come out as perfect insects. Amongst the hive-bees the unfecundated eggs produce males or drones, while the fertilised eggs produce females or workers. This is a remarkable contrast to the eggs of all vertebrate animals; for no egg has ever with certainty been known to produce a new being without fecundation.

The wild bees differ from the comb-makers or hive-bees in many ways. Thus in the indigenous species, as before stated, the males precede the females, and both sexes are nearly, if not quite, equal in numbers; and although they are gregarious in their habits, they make no combs, strictly speaking, and lay up no honey, only sufficient food for the larva to feed upon and to go through its various changes before it emerges into the light of day. Many of the British bees are double-brooded, the last brood being in August or thereabouts. It is this brood that provides for the ensuing spring, the pupæ remaining in the cells until the following spring; and several of the humble bees remain through the winter, as do some, if not all, female wasps and hornets, in a torpid state. These are fertilised females, and the founders of fresh colonies or nests.

Nearly all our bees are subject to the attacks of various parasites, some of which are so nearly like the bees in form and colour that they can walk in and out of their nests with the general assurance of safety. Thus the species of *Apathus*, parasitic on the humble bees, are so nearly like their host that they require the examination of the entomologist in some instances to determine which is which. Mr. F. Smith, in the second edition of his *British Bees*, p. 220, doubts a statement made by Mr. Shuckard that these parasites are double-brooded. "Shuckard," writes Mr. Smith, "says they have two broods in the year." "Upon what data this statement is made does not appear (my own observations have not led me to adopt this opinion)." This year (1880), on May 14th, I captured a fine female of *Apathus vestalis*, which, to all appearance in freshness of colour, had just emerged from the pupa, and which, to my mind, somewhat bears out the assertion of Mr. Shuckard that they are double-brooded. At the same time, this may have been an exception, as it is the only instance that has come under my notice, and Mr. Smith may be right that they are single-brooded only. In the autumn they are generally abundant. Still it is very remarkable

that they should attack the autumn brood of the Bombi only, and not the spring or summer one; and it is also remarkable that these Cuckoo bees should be so long in coming to the perfect state. The egg, say, is deposited in the cell of the humble bee in September or October at the latest; it will then be some ten months before it emerges as a perfect insect.

The parasitic bees attached to the genus *Andrena* and the *Halicti*, are as remarkable for their great dissimilarity to the bees on which they are parasitic, as the *Apathi* are for the great similarity to the Bombi. The Cuckoo bees, as they are generally called (and it is a very good name for them, as they make no nest of their own, but leave their young to be developed in the nest of another), are painted by nature in very bright colours, being chiefly yellow and black—some are red and yellow, or red, yellow, and black—and in moving about, which is done in a somewhat stealthy fashion, they make no noise with their wings. From their colour and general appearance they might, and sometimes are, taken for small wasps by the uninitiated.

These insects are, however, not the only creatures parasitic on the bees. Several species of *Stylops* affect certain of the *Halicti* and the *Andrenas*; one species of *Halictus* is, for some unexplained cause, particularly subjected to the torture of a *Stylops*; for it must, I think, be torture to have two or three of these parasites lodged between the rings of the abdomen, with the soft body of the creature inserted into the flesh, or fatty matter, from which it absorbs its nourishment, whilst its head is protruded between and beyond the abdominal rings. As the parasites grow in size so the abdominal rings are forced asunder, like having so many wedges driven between them, to the great inconvenience of the poor bee.

A very beautiful, and at the same time a very scarce insect, has been found parasitic in the nests of *Bombus muscorum*, the mosscarder bee. The parasite is called *Mutilla Europea*. It is, I believe, very rare with us; but it has been taken in the furze-brake, in Stoke Wood, near Exeter. I may mention here the discovery of another very rare parasite, which occurs occasionally on the hive bees, *Apis mellifica* and *A. Ligustica*. This curious creature was found by the late Mr. Woodbury, the apiarian, of Mount Radford, Exeter, who kindly presented me with a specimen. It was found in March, 1863. It is called *Braulia cæca*.

Before we take leave of this department of our subject, I should wish to draw the attention of the student to a curious, and at the same time an interesting matter, connected with

the colouration of the Andrenidæ. The subject has received the attention of Mr. F. Smith, but it still remains inexplicable. Some of these bees are beautifully coloured on the abdomen with bands, or marks of red and brown, or orange and brown. *A. austriaca*, *A. spinigera*, *A. florea*, and *A. decorata* are instances of this colouration. These are liable to great variation in the intensity of their markings, and from observations, extending over many years, it is found that this colouring depends on the amount of sunshine. In dull seasons the bees are dull in colour, in bright sunshine they are bright in colour, so much so that they might easily be taken for other species, did the specific characters depend upon their colouring alone. Which, then, is the normal condition of these bees? Suppose they were removed to a more sunny clime, their colours would be developed. Would they, in course of time, become fixed, and not vary with the amount of sunlight as they do in this country? Some species or forms, so far as our short lives allow us to note them, appear firmly fixed, whereas others living under precisely the same conditions are as variable as they can well be. What is the reason of this? is one of the questions that are constantly cropping up before the natural history student.

The ants are perhaps the most wonderful for their intelligence of all the insect world. The strange and remarkable stories that have been told of them, if one half be true, put all other insects into the shade. Huber, the great authority for these industrious creatures, has been almost surpassed by the studies of Sir John Lubbock, whose patience and perseverance are beyond all praise. The results of his studies of the various Formicaria kept by him have been published in the *Journal* of the Linnean Society, and in a series of lectures.

The ants inhabiting this country are divided into groups, or families; the one is called Formica, and includes the so-called "horse ants," or wood ants, those fierce-looking active creatures seen in the woods collecting bits of sticks and leaves, and piling them up into a large heap. This is their formicarium, or nest; and if a section were made of this heap you would see a most wonderful structure revealed to you, composed of floors, galleries, and intricate passages, the floors supported on pillars, all constructed on a plan conducive to the well-being of the community. All the Formicidæ collect more or less materials for the building of their nests, whilst the group Myrmicidæ burrow in the ground, and make heaps amongst the stems of grass of the excavated material; and in this heap the rooms and passages

leading to corridors and airing-rooms are constructed with wonderful ingenuity and skill. Here the young and the pupæ are brought out to air them by the attentive nurses, and the greatest possible care is exercised in their bringing up. "I have observed," says Sir John Lubbock, "that they are often sorted according to age. It is sometimes very curious in my nests to see the larvæ arranged in groups according to size; so that they remind one of a school divided into five or six classes. When full grown they turn into pupæ, sometimes naked, sometimes covered with a silken cocoon, constituting the so-called 'ant eggs.' After remaining some days in this state they emerge as perfect insects.

"In many cases, however, they would perish in the attempt if they were not assisted; and it is very pretty to see the older ants helping them to extricate themselves, carefully unfolding their legs, and smoothing out their wings with truly feminine tendings and delicacy."*

Ants, in many cases, in their constitutional arrangement, do not view the subject of slave-making in the light of us Western people, who are opposed to slavery of every form. In this respect the ants still retain the Eastern proclivities; and by their long employment of slaves, one species in particular has become so enfeebled that their very bodily structure has undergone a change; their mandibles have lost their teeth, and have become mere nippers; they have lost the greater part of their instincts; their art, that is the power of building; their domestic habits have changed; for they take no care of their young, all being done by slaves. Should these idle aristocratic ants desire to change their old for a new abode, the slaves have to carry them, as they are too lazy to walk, and, to crown all, they are too lazy to feed themselves.

The name of these idle creatures—for they deserve to be well-known—is *Polyergus rufescens*. Sir J. Lubbock, to test the accuracy of the celebrated Huber's observations on this species, says, "I have kept a nest of this species under observation for a long time, but I never saw one of the masters feeding; and although surrounded by the best of food they would not help themselves, but would actually die if the slaves are not there to attend to them. As for cleaning themselves, this does not seem to enter into their heads, the slaves have to valet them."

The contrast of these idle creatures with the Agricultural or Harvesting Ants is very striking, for these not only store

* *Lectures*, p. 70.

up seeds but actually cultivate the plants which provide them, and carefully gather in the crop at the right season. In wet seasons the ant granaries are apt to get wetted and the seeds to sprout out. And they have learnt by this, that to preserve their store they must dry it as soon as possible. On the first fine day therefore the ants bring out all the wetted grain and put it in the sun to dry, and if any is observed really injured this is left, and only the sound grain returned to the store.

The marvellous instinct, or rather common-sense, displayed by some of these insects almost surpasses belief. The numerous stories that are told and chronicled form quite a literature of their own. One of the latest is that of a "species discovered with a new Pitcher-plant in Borneo. The pitcher is called *Nepenthes bicalcarata*. The curious pitchers are perfect insect-traps to all creeping insects that chance to go in. This by some means has been discovered by a species of ant which lives in its neighbourhood. The ant, being carnivorous, in order to get at the insects entrapped, instead of going into the mouth and getting made a prisoner as well, has had sufficient knowledge to tunnel or bore a hole through the stem, so as to get at the prey and so save its own life"*

To show that this common-sense is not all on the side of the ants, our humble bees have attained to the same knowledge as regards the extraction of honey from a plant not indigenous to this country. Therefore the fact is still more remarkable, as the bees must have ascertained this for themselves. The fact is well known to observers, that the flowers of the common broad-bean and the horse-bean are too small in the mouth to admit of the large bombi; but, not to be deprived of the sweets contained within, they with the hard and sharp lancet-like sheaths of the proboscis pierce the base of the flower just above the nectarium, and so extract the honey contained within.

One of the most remarkable instances on record of the absolute necessity of ants to the vegetable kingdom is narrated by Signor Beccari, concerning two plants, natives of Borneo, named from the fact of their dependence on the ants, viz., *Myrmecodia echinator*, and *M. glabra*. The ant attached to these is closely allied to, if not identical with, *Pheidole Javana*. These ants form galleries in the trees, and so close is the connection of the trees and the ants, that the trees cannot or will not flourish without them. Signor Beccari has studied the *Myrmecodia* in the native localities, and he asserts that the presence of the ants is essential to the plant's existence ;

* *Athenæum*, 1880, p. 317, *partem*.

for unless the young plants are attacked by the ants they soon die. *

There yet remains a great deal to be understood connected with the domestic arrangements of ants; for instance, what position does the small white woodlouse-looking insect occupy in the household? It walks about among the swarming ants with perfect freedom, whereas an insect not a pet would be at once attacked and torn limb from limb; but the little *Platyarthrus Hoffmannseggii* is perfectly safe among them. I met with this insect, some years ago, in a nest of ants, at Fordlands, near Exeter. Ants are able to recognise friends from foes, as has been tested by Sir John Lubbock; but in what way they recognise them, whether by sight, feeling, or smell, has not been ascertained. Communication by sound to each other has been suggested, and that both bees and ants have some means of "communicating their wants or feelings to one another is certain. If it be by sounds, these must be of such delicacy as to be beyond the reach of the human ear. Professor Bell and Sir John Lubbock tried some experiments with the most delicate microphone, by attaching one to a nest of ants, but all that could be detected was the noise made by the ants walking about. They could distinguish no other sound."† By what means then the ants are able to distinguish their friends, whether they be friends or pets, kept for some unknown purpose, is an enigma yet unsolved.

Besides the little woodlouse creature, there have been found eighteen species of beetles in the nests of *Formica rufa*; and besides these, a small species of ant, *Stenammina Westwoodii*, lives in perfect harmony with these large, formidable horse-ants; so that these large ants must have some means of knowing these pets from other intrusive or curious, prying insects.

But this species is not the only one that keeps pets; for *Formica fuliginosa* has fifteen species of small beetles attached to its formicaria, and *Formica fusca* five species. It has been suggested that these beetles act as scavengers to the ants; but we have no proof of this, and what their real office is yet remains to be discovered.

Ants, I believe, are the only insects which keep cows for their own use. These cows are the gardener's pest, the Aphides. They are, as all observers know, tended by the ants with the greatest care. If an aphid falls down, and is discovered by the ants, it is taken up carefully and placed

* *Athenæum*, March 6th, 1880, p. 317, *partem*. † *Lecture iv.*, p. 122.

upon the plant. In Europe the ants are specially attached to the Aphides, but in the tropics their place is taken by species of scale insects, the Coccidæ and species of Homoptera. Mr. Belt informs us "that at least four genera of ants, in Nicaragua, keep scale insects as we do cows. The genus *Solenopsis* builds domed galleries or byres for the protection of its insect cattle, and otherwise tends them carefully." *

The Myrmicidæ are the principal cow-keepers in this country; they may be seen in constant attendance on the Aphides. The "green flies," as they are generally termed, puncture the various plants, trees, and shrubs, on the sap of which they live. During its progress of passing through the aphid, the sap becomes converted into what is termed honeydew: it is not the excreta of the insects, but it oozes out of those two horn-like processes which stand out of the posterior part of the insect's body on each side. They are termed "cornicles," and it is from these cornicles that the ants derive the greater part of their sustenance; for they have a very sweet tooth, and they are in constant attendance on these aphides. By watching them attending on the green flies, if the aphid is not giving out the sweet liquor as fast as she should, the ant may be seen gently drawing its antennæ down the insect's back and along the cornicles, as if it were coaxing it to give out more milk.

But I must draw this paper to a close, and before doing so I may state that three species of ants mentioned in the catalogue I believe are foreign species introduced with plants, and have become more or less naturalised. These are *Pheidole lævigata*, taken in one of Messrs. Veitch's hothouses, on the Topsham Road, in 1857; *Myrmica simillima*, I took in a nest in a hothouse at Mr. Parkin's, Union Road, Exeter, in 1876; and *Formica gracillium*, in a stove at Messrs. Veitch's, in 1857.

There are in the British Museum several species of insects belonging to this group of Aculeate Hymenoptera, supposed to have been captured by Dr. Leach on the south coast of Devonshire. These require verification by the capture of other specimens. Devonshire, so far as I am aware, is inferior to no county in this group of insects, the Aculeata. My own collection contains 289 species, and about 1,600 specimens. There are several species that have been taken by other collectors, especially the late Mr. F. Smith, that I have not taken myself, but hope to do so, and to add others to this list.

* *Travels in Nicaragua.*

CATALOGUE.

WITH NOTES AND OBSERVATIONS.

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Order, HYMENOPTERA, *Linnaeus*.
 Tribe, TUBULIFERA, *St. Fargeau*.
 Family, CHRYSIDIDÆ, *Leach*.
 GENUS, **HEDYCHURUM**, *Latrielle*.

ARDENS, *Curtis*.

Smith, F., Ent. Ann., p. 99, 1862.

Captured by Mr. F. Smith, on Salcombe Hill, near Sidmouth, August, 1872; recorded in Ent. Ann., 1872, p. 102.

ROSEUM, *St. Farg.*

Smith, F., Ent. Ann., p. 100, 1862.

Taken at Budleigh Salterton, in August, 1872, by Mr. Smith.

CÆRULESCENS, *St. Farg.*

Smith, F., Ent. Ann., p. 98, 1862.

Taken by Mr. F. Smith, on High Peak, Sidmouth, in August, 1872.

GENUS, **CHRYSLIS**, *Linnaeus*.

IGNITA, *Linn.*

Smith, F., Ent. Ann., p. 86, 1862.

Generally plentiful, flying round old gate posts, and settling on hot walls and places exposed to the sun.

This species varies very much in size, some only measuring three and others six lines in length; the colour of the head and thorax also varies, from an intense cerulean blue to the most charming emerald green. Amongst my set of specimens I have several of the varieties given by Mr. Smith; namely, *Halcione*, with the two central teeth widest apart, and *Asterope*, with the two central teeth nearly together, and *Electra*, with the terminal teeth at equal distances.

SUCCINCTA, *Linn.*

Smith, Ent. Ann., p. 91, 1862.

The late Mr. Dale informed me, a short time previous to his decease, that Captain Bloomer captured this species at Bigbury Bay.

FULGIDA, *Linn.*

Curtis, Brit. Insects, i. f. 8; *Smith*, Ent. Ann., p. 88, 1862.

This beautiful insect was taken at Teignmouth by Mr. F. Walker.

BIDENTATA, *Linn.*

Smith, F., Ent. Ann., p. 90, 1862.

This was captured by Mr. F. Smith, on High Peak, Sidmouth, August, 1872. I took many specimens of this very beautiful and extremely active species, running in and out of holes in a sandy bank at Fordlands, near Ide, July, 1857.

CYANEA, *Linn.*

Smith, F., Ent. Ann., p. 92, 1862; *Donovan*, Brit. Insects, vol. vii., pl. 235.

Also taken on High Peak, Sidmouth. I took many specimens coming out of holes of an old post in the footpath fields near the Old Abbey, Exeter, and also in holes in a mud wall near St. Thomas's Asylum, June 20th, 1856.

GENUS, *HOMALUS*, *Panzer.*

AURATUS, *Linn.*

Smith, F., Ent. Ann., p. 101, 1862.

I bred this little gem from bramble sticks I collected for rearing some of the smaller Crabronidæ, and from which came out, in due time, *Cemonus Lethifer*, and *Crabro tibialis*, so that this insect is probably parasitic on one of these two species (?)

CÆRULEUS, Dalb.

Smith, F., Ent. Ann., p. 102, 1862.

I captured this pretty insect in the garden of the late Mr. Ross, at Topsham, in July, 1857.

Tribe, HETEROGYNA, Latreille.

Section, ACULEATA, Latreille.

Family, FORMICIDÆ, Leach.

GENUS, FORMICA, Linnaeus.

RUFA, Linn.

Curtis, Brit. Insecta, xvi., pl. 752; Smith, F., Cat. Brit. Foss. Hymen., p. 4.

The most abundant species in our woods, especially where the soil is sandy. The great masses of materials—bits of sticks, leaves, &c.—brought together by these industrious insects to form their nests, which are heaped up into a cone, remind one of the nests of the great white ant, or Termites, on a smaller scale. I noticed at Dawlish, June 19th, a large number of this species running about on a path leading to the new pleasure-ground. Some of these, unfortunately, got trod on by persons passing that way. The ants so disabled were discovered by their comrades, and carefully taken up and carried away out of further danger.

CONGERENS, Nylander.

Smith, Cat. Brit. Foss. Hymen., p. 6.

This species is undoubtedly overlooked, or passed by for the one above, as this has habits similar to *rufa*, and the same size and colour as that species, but when held in profile, and viewed with a lens, it will be found to be thinly clothed with short pale hairs; on and towards the apex of the abdomen the short stiff hairs are of a shining pale yellow. I met with two small nests of this species in Stoke Wood, near Exeter, in September, 1879.

CUNICULARIA, Latr.

Smith, Brit. Foss. Hymen., p. 8.

Not very common. The workers might easily be taken for small specimens of *rufa*; but these make their nest in more open places away from woods, whereas *rufa* is mostly confined to woods. I met with a nest in a meadow below Trewe's Weir, near Exeter, and another in Coaver Garden; and Mr. Smith took it plentifully on Peak Hill, Sidmouth, and also on the coast of North Devon. I

visited Peak Hill in August this year (1880), and could not discover a single specimen.

FUSCA, Linn.

Smith, Brit. Foss. Hymen., p. 9.

An abundant species everywhere, at the foot of warm hedgebanks, where it prefers to make its nest.

FULIGINOSA, Latr.

Smith, Brit. Foss. Hymen., p. 10.

A common species, and generally distributed; mostly found about old stumps of trees, in hedgerows, and sides of woods. The most distinct species as regards colour of the whole group.

NIGRA, Linn.

Smith, Brit. Foss. Hymen., p. 12.

Very common in grass-fields and gardens everywhere.

ALIENA.

Smith, in Ent. Ann., 1872.

This was taken by Mr. Smith on High Peak, Sidmouth, 1872. In 1867 I captured specimens of the worker and the winged sexes in a nest on the sands in Croyde Bay, North Devon. These, I think, were the first taken in this country.

FLAVA, De Geer.

Smith, Brit. Foss. Hymen., p. 15.

Abundant in pastures and at the base of warm hedgebanks throughout the country. This was the only species I met with on Peak Hill this year; the nests were plentiful.

UMBRATA, Nylander.

Smith, Brit. Foss. Hymen., p. 14.

This was taken by Mr. Smith on the North Devon coast, 1870, but it is certainly a rare species with us. I have taken it on Exmouth Warren.

GENUS, TAPINOMA, Foerst.

ERRATICA, Latr.

Smith, Brit. Foss. Hymen., p. 16.

This little ant would seem to be rare with us. The only locality I know for it is Bovey Heathfield, where I captured the workers only in June, 1862.

Family, PONERIDÆ, *Smith*.

GENUS, PONEKA, *Latreille*.

CONTRACTA, *Latr.*

Stephens, Ill. Brit. Ent. Supp., pl. 42, f. 2; *Smith*, Brit. Foss. Hymen., p. 19.

Very rare. My friend, Mr. J. J. Reading, took several specimens of this near Plymouth, in 1862, and I captured a female flying near Exeter some years ago, and one this year (1880). These are the only specimens I have seen of this very distinct species.

Family, MYRMICIDÆ, *Smith*.

GENUS, MYRMICA, *Latreille*.

The genus *Myrmica*, as represented by our British forms, will, I fear, have to be reduced to two species only; viz., *scabrinodis*, from the peculiarity of its antennæ, will, I think, retain its place; and *ruginodis*, *sulcinodis*, and *lævinodis*, will have to be relegated to some recognised specific form. The names they now bear might stand to denote them as varieties or races of the types I have indicated. This reduction of our forms has been made by some of the continental entomologists.

SCABRINODIS, *Nylander*.

Smith, Brit. Foss. Hymen., p. 22.

An abundant species everywhere, especially where the soil is light, and sandy, and warm. This may be known at once by the peculiarity of its antennæ.

LOBICORNIS, *Nylander*.

Smith, Brit. Foss. Hymen., p. 25; *Curtis*, Trans. Linn. Soc., vol. xxi., pl. 23., f. 20.

This form comes so close upon *scabrinodis* that it must be regarded as a variety of the species only.

RUGINODIS, *Nylander*.

Smith, Brit. Foss. Hymen., p. 20.

This is common by the side of footpaths in grass-fields, and by woodsides. On Exmouth Warren, Plymouth, &c.

LÆVINODIS, *Nylander*.

Smith, Brit. Foss. Hymen., p. 23.

Generally distributed, both in North and South Devon.

This, with *ruginodis* and *sulcinodis*, requires nice discrimination, as their general facies are much alike, and a cursory observation would not decide their difference.

SULCINODIS, *Nylander*.

Smith, Brit. Foss. Hymen., p. 24; *Curtis*, Trans. Linn. Soc., vol. xxi. p. 214, pl. 23, f. 15, 16, 17.

So far as my own observation goes, I consider this rare

with us. The only places I have met with it are at Lustleigh Cleave and Sandy Gate, St. George's Clist.

GENUS, **TETRAMORIUM**, *Mayer*.

CÆSPITUM, *Linn.*

Curtis, Trans. Linn. Soc., vol. xxi, p. 215; *Smith*, Brit. Foss. Hymen., p. 26.

This little species is tolerably common on Haldon, Blackdown, and on Exmouth Warren, Plymouth, &c. It evidently prefers warm sandy soil to any other.

LIPPULA, *Nylander*.

Curtis, Trans. Linn. Soc., vol. xxi, p. 216; *Smith*, Brit. Foss. Hymen., p. 28.

An extremely rare species. The only specimen hitherto recorded as having been taken in the county is a single worker captured by Mr. Reading at Plymouth. Since Mr. Reading's capture I have taken a worker in the nest of *Formica rufa*.

GENUS, **LEPTOTHORAX**, *Mayer*.

ACERVORUM, *Fabr.*

Smith, Brit. Foss. Hymen., p. 29.

This species forms little runs by the side of walls and in stumps of dead trees. I met with several small nests under the path of the sea-wall at Dawlish in July, and on Woolacombe Sands, North Devon.

RETICULATA, *Smith*.

Trans. Ent. Soc., vol. i, ser. 3, pt. 1, p. 5.

I captured this species in one of the hothouses in the late Mr. Veitch's Nursery on the Topsham Road. I forwarded specimens to Mr. Smith, who pronounced it a new species. It may be said, perhaps, that this insect cannot be regarded as British; but I hold that as the species bred here, though not exposed in the open air, it has just as much right to be called a British species as several others, and if we carry this argument into Ornithology, it is certainly more pronounced than killing a European or other bird on English soil and calling it British.

NYLANDERI, *Foerst.*

Curtis, Trans. Linn. Soc., vol. xxi, p. 218, No. 15 male; *Smith*, Brit. Foss. Hymen., p. 30.

This very pretty and distinct species I found at Stoke, and also in the lane leading from Marypole Head, Exeter, to Cowley Bridge. The little colony had taken possession of an old oak stump, which had been bored into by some

beetle, probably an *Anobium* (?), and in those holes the insects had their runs, their nest being in a larger hole. Another colony had taken possession of a hollow stick, in which they had a nest, August, 1864.

SIMILLIMA, Nylander.

Smith, Brit. Foss. Hymen., p. 31.

This appears to be an extremely rare species. I sent specimens to my friend, the late Mr. F. Smith, of the Zoological Department of the British Museum. I fear, however, that it cannot be considered indigenous to this country, although they breed here freely enough; but they are found in hothouses, or, in very warm weather, some may, and do, escape from these into the open air. In June, 1876, I saw a very large colony in a hothouse at Mr. Parkin's, Union Road, Exeter. The finding this insect under the above conditions would not pronounce it to be of foreign origin, as our acknowledged indigenous species will live and flourish under similar conditions, so that the habitat is of minor importance. The chief thing, so far as I am aware, is, that this species has now been found making a nest in the open air.

GENUS, *DIPLORHOPTRUM, Mayer.*

MOLESTA, Say.

Curtis, Trans. Linn. Soc., vol. xxi., p. 217; Smith, Brit. Foss. Hymen., p. 34.

This minute species is very troublesome in some of the houses on Southernhay, Exeter, and Plymouth. It prefers the warm kitchen to anywhere else, hence it becomes very annoying, as it runs over everything. It is supposed to be an imported species, probably from South America. It has, I believe, never been found out of doors in this country.

In Mr. F. Smith's revision of the *British Formicidæ*, 1857, he shows that Say's name of *Molesta* has the preference of Shuckard by four years.

GENUS, *PHEIDOLE, Westwood.*

PALLIDULA, Mayer.

Brit. Foss. Hymen., p. 35; Ent. Ann., 1862, pl. f. 7, 8.

This very remarkable little species I captured in some numbers at the time; namely, 1857. The workers vary very much in size; but their enormous heads, as compared with their bodies, distinguish them at once from any other species found in this country. This insect,

like *M. Molesta*, is probably an imported one; and, as Mr. Smith remarks, it is the common house ant of Madeira. I met with my specimens, as well as some I sent at the time to Mr. Smith, in one of the hothouses at Mr. Veitch's Nursery on the Topsham Road, which has long since been destroyed.

Family, MUTILLIDÆ, Leach.
GENUS, MUTILLA, Linnaeus.

EUROPÆA, Linn.

Donovan, Brit. Ins., vol. vi., t. 212; Smith, Brit. Foss. Hymen., p. 39.

Very rare in Devonshire. Only two specimens have come under my notice, one of which was captured in the furze-brake in Stoke Wood, near Exeter.

GENUS, MYRMOSA, Latreille.

MELANOCEPHALA, Fabr.

Shuckard, Foss. Hymen., p. 33; Smith, Brit. Foss. Hymen., p. 43.

I have seen only one specimen, and that is a male. I took it at Christow, July 12th, 1858. Mr. Bignell has taken a specimen this season (1880) near Plymouth.

GENUS, METHOGA, Latreille.

ICHNEUMONIDES, Latr.

Smith, Brit. Foss. Hymen., p. 45.

This very rare insect was captured by Mr. F. Smith, on High Peak, Sidmouth, in August, 1872.

Tribe, FOSSORES, Latreille.
Family, SCOLIADÆ, Leach.
GENUS, TIPHIA, Fabricius.

FEMORATA, Fab.

Shuckard, Foss. Hymen., p. 39; Smith, Brit. Foss. Hymen., p. 47.

Scarce. I have taken specimens at Fordlands, near Ide, and also in Stoke Wood, near Exeter, in July and August, 1853. Mr. Smith captured this species on the coast of North Devon.

MINUTA, Van der Lind.

Shuckard, Foss. Hymen., p. 42; Smith, Brit. Foss. Hymen., p. 48.

Dr. Leach captured this species on Braunton Burrows, and I have taken several specimens on Langstone Cliff, near Dawlish, in July. It is by no means a common insect. Mr. Smith says it is a rare species. I have five specimens captured in Devon by myself.

Family, SAPYGIDÆ, Leach.
GENUS, SAPYGA, Latreille.

PUNCTATA, Fabr.

Shuckard, Foss. Hymen., p. 44 ; *Smith*, Brit. Foss. Hymen., p. 50.

This insect is parasitic, probably on *Trypoxylon figulus*, as I have caught them coming out of the holes in old posts inhabited by the above insect, in the footpath fields, leading from the old Abbey to Countess Weir, June, 1856.

CLAVICORNIS, Linn.

Shuckard, Foss. Hymen., p. 75 ; *Smith*, Brit. Foss. Hymen., p. 51.

Very rare. Only one specimen has fallen to my lot in nearly thirty years' collecting in Devonshire. This was taken, in May, 1859, in the neighbourhood of Exeter.

Family, POMPILIDÆ, Leach.
GENUS, POMPILUS, Fabricius.

FUSCUS, Linn.

Shuckard, Foss. Hymen., p. 64 ; *Smith*, Brit. Foss. Hymen., p. 54.

Not uncommon. On warm, sunny banks where the vegetation is absent, or very thin, this insect may be seen prying into holes, at the same time vibrating its wings as if it were in a very nervous condition. Taken on High Peak, Sidmouth, where it is not uncommon.

GIBBUS, Fabr.

Smith, Brit. Foss. Hymen., p. 55.

On the sands at Woolacombe, North Devon. Rather rare. Mr. F. Smith. And also on High Peak, Sidmouth, in August.

PECTINIPES, Linn.

Shuckard, Foss. Hymen., p. 63 (*P. Crassicornis*) ; *Smith*, Brit. Foss. Hymen., p. 56.

So far as I am aware this is a scarce insect with us.

PLUMBEUS, Fabr.

Shuckard, Foss. Hymen., p. 49, No. 1 ; (*Pulcher*) ; *Smith*, Brit. Foss. Hymen., p. 58.

Captured on the Sand-hills, on Exmouth Warren, in August. Not uncommon. Also on Branton Burrows, North Devon.

CINCTELLUS, Spin.

Shuckard, Foss. Hymen., p. 55 ; *Smith*, Brit. Foss. Hymen., p. 60.

By no means common. I captured specimens on a warm bank near the Old Abbey, Exeter, in 1856, and one on the flowers of *Scilla autumnalis*, on Prawle Point, on August 3rd, 1877.

RUFIPES, Linn.

Shuckard, Foss. Hymen., p. 58 ; *Smith*, Brit. Foss. Hymen., p. 62.

Captured on the sand-hills, on Exmouth Warren. Rather rare. It has been taken also on High Peak, Sidmouth, in August.

GENUS, **PRIOCHENIS**, *Schödtle*.

SEPICOLA, Smith.

Shuckard, Foss. Hymen., p. 64, No. 15 ; *Smith*, Brit. Foss. Hymen., p. 63.

This is one of the commonest species of the genus, and is met with on warm hedges and naked spots on sandy commons, in July and August.

EXALTATUS, Fabr.

Shuckard, Foss. Hymen., p. 66 ; *Smith*, Brit. Foss. Hymen., p. 65.

I took this species, in May, 1856, near the Old Abbey, Exeter, on the flowers of the common ranunculus. The sexes in this species vary very much in size. This has also been taken on both the north and south coasts.

PARVULUS, Dalt.

Hymen. Europ., vol. i., p. 460 ; *E. Saunders*, in Ent. Mont. Mag., vol. xvii., p. 98.

Very rare ; I have one specimen, a male, captured in the county.

PUSILLUS, Schödtle.

E. Saunders, in Ent. Mont. Mag., vol. xvii., p. 99.

I captured a male of this species some years ago on Haldon ; it appears to be very scarce.

HYALINATUS, Fabr.

Shuckard, Foss. Hymen., p. 57 ; *Smith*, Brit. Foss. Hymen., p. 68.

I have one specimen of this apparently scarce species, taken near Exeter in 1868.

GENUS, **AGENIA**, *Schödtle*.

BIFASCIATUS, Fabr.

Shuckard, Foss. Hymen., p. 52 ; *Smith*, Brit. Foss. Hymen., p. 71.

This very rare insect was taken by Mr. F. Smith on Woolacombe Sands, North Devon.

GENUS, **CEROPALES**, *Latreille*.

VARIEGATA, Latr.

Shuckard, Foss. Hymen., p. 71 ; *Smith*, Brit. Foss. Hymen., p. 77.

This rare species was taken by Dr. Leach, in Devonshire. The specimens are in the National Collection in the British Museum.

GENUS, *APORUS*, *Spinola*.*FEMORALIS*, *Van der Lind*.*Smith*, Ent. Ann., 1872, p. 104.

Mr. Smith captured this rare insect on the summit of High Peak, Sidmouth, in August, 1872.

Family, *SPHEGIDÆ*, *Leach*.GENUS, *AMMOPHILA*, *Kirby*.*SABULOSA*, *Linn*. *The Common Sand Wasp*.*Shuckard*, Foss. Hymen., p. 75 ; *Smith*, Brit. Foss. Hymen., p. 81.

Not uncommon on the sand-hills on the Warren and Exmouth, on Haldon, Woodbury Common, Plymouth, &c., from June to September. Taken also on the north coast on the sands.

VIATICA, *Linn*. *The Hairy Sand Wasp*.*Kirby*, Trans. Linn. Soc., vol. iv., p. 206 ; *Smith*, Brit. Foss. Hymen., p. 82.

I captured this species on the sand-hills at Exmouth. It was pitching about amongst the tufts of grass and rushes, on the 6th May, 1863 ; two females and a male. Captured in North Devon by Mr. F. Smith.

GENUS, *DOLICHURUS*, *Latreille*.*CORNICULUS*, *Spin*.*Stephens*, Ill. Man., vol. vii., Supp., t. 42, f. 1 ; *Smith*, Brit. Foss. Hymen., p. 87.

This very rare insect was captured by Dr. Leach, near Ashburton, as recorded by Stephens.

Family, *LARRIDÆ*, *Leach*.GENUS, *TACHYTELES*, *Panzer*.*POMPILIFORMIS*, *Panzer*.*Shuckard*, Foss. Hymen., p. 89 ; *Smith*, Brit. Foss. Hymen., p. 88.

Taken on the hot sandy hedge-banks near the sea, on both north and south coasts. Not very common.

GENUS, *ASTATA*, *Latreille*.*BOOPS*, *Schrank*.*Donovan*, Brit. Insecta, v. xii., t. 78 ; *Smith*, Brit. Foss. Hymen., p. 95.

I have a specimen of the variety B, a female, having only the extreme margin of the third segment red. This species appears to be rare with us.

Family, NYSSONIDÆ, Leach.

GENUS, NYSSON, Latreille.

INTERRUPTUS, Fabr.

Shuckard, Foss. Hymen., p. 101 ; *Smith*, Brit. Foss. Hymen., p. 98.

I have two specimens that were given to me from Mr. Raddon's collection, by the purchaser of that gentleman's cabinet of British insects, the late Mr. Sydney Style, of High Street, Exeter. As Mr. Raddon lived in North Devon, and collected insects on the sand-hills of Braunton and Northam Burrows, I presume these specimens were captured there.

DIMIDIATUS, Jurine.

Shuckard, Foss. Hymen., p. 104 ; *Smith*, Brit. Foss. Hymen., p. 101.

Very rare. Only one specimen has fallen to my lot, and this I took on the sand-hills at Exmouth, the beginning of August, 1854.

GENUS, GORYTES, Latreille.

MYSTACEUS, Linn.

Shuckard, Foss. Hymen., p. 211 ; *Smith*, Brit. Foss. Hymen., p. 102.

This insect, although common in most places, does not appear to be so here. I have specimens from North Devon, and I have taken it very sparingly in South Devon, in June.

FARGEII, Shuck.

Shuckard, Foss. Hymen., p. 214 ; *Smith*, Brit. Foss. Hymen., p. 104.

I met with this species excavating a hole in the cliffs at Exmouth, in May. It appears to be a scarce species.

GENUS, MELLINUS, Fabricius.

ARVENSIS, Linn.

Shuckard, Foss. Hymen., p. 203 ; *Smith*, Brit. Foss. Hymen., p. 113.

A common species, and generally distributed in warm sandy places all over the country.

Family, CRABIONIDÆ, Leach.

GENUS, TRYPOXYLON, Latreille.

FIGULUS, Linn.

Shuckard, Foss. Hymen., p. 115 ; *Smith*, Brit. Foss. Hymen., p. 117.

I have taken this species running into holes in old gate posts, and also going into the burrows of *Halictus morio*, in a warm hedge bank, near the Old Abbey, Exeter, in June. Mr. F. Smith has taken it on High Peak, Sidmouth, in August.

CLAVIOERUM, *St. Farg.*

Shuckard, Foss. Hymen., p. 118 ; *Smith*, Brit. Foss. Hymen., p. 118.

Mr. Smith obtained this species on High Peak, Sidmouth, in August, 1872 ; also on Woolacombe Sands, in North Devon.

ATTENUATUM, *Smith.*

Brit. Foss. Hymen., p. 119.

Bred from bramble sticks, in the pith of which the female bores and constructs the cells in which she deposits her eggs. The perfect insects come out in May.

GENUS, *CRAEBO*, *Fabricius.***CLAVIPES, *Linn.***

Shuckard, Foss. Hymen., p. 178 ; *Smith*, Brit. Foss. Hymen., p. 22.

Apparently rare. Captured by Mr. D'Orville at Alington, and by Mr. Bignell at Plymouth.

TIBIALIS, *Fabr.*

Shuckard, Foss. Hymen., p. 177 ; *Smith*, Brit. Foss. Hymen., p. 123.

Very rare. I have seen only one pair. Mr. Bignell has taken it at Plymouth.

DIMIDIATUS, *Fab.*

Shuckard, Foss. Hymen., p. 151 ; *Smith*, Brit. Foss. Hymen., p. 124.

Captured in some numbers, near the old mine by the river at Lydford. They were basking in the sun on the leaves of an alder bush, August 4th, 1879.

ELONGATULUS, *Vand der Lind.*

Shuckard, Foss. Hymen., p. 154 (*C. luteipalpis*) ; *Smith*, Brit. Foss. Hymen., p. 127.

Captured flying round an old post, in which they appeared to be burrowing, at St. Mary's Clyst, July, 1866. I met with several specimens, basking in the sun on leaves of alder, by the side of the Lyd, near Lydford, August, 1879. High Peak, Sidmouth, Mr. F. Smith.

VARIUS, *St. Farg.*

Shuckard, Foss. Hymen., p. 163 ; *Smith*, Brit. Foss. Hymen., p. 129.

Taken in North Devon by Mr. Smith, 1870.

LEUCOSTOMA, *Linn.*

Shuckard, Foss. Hymen., p. 153 ; *Smith*, Brit. Foss. Hymen., p. 131.

I bred this species from pupæ, found in a sort of touch-wood ; the larvæ appeared to have been supplied with diptera, and principally those brilliant green-bodied

Sarcophagi. The insects were forced out in March in a hothouse, 1857.

{ EXIGUUS, *Shuckard*.
 { ANXIUS, *Wesm*.

Shuckard, Foss. Hymen., p. 174; *Smith*, Brit. Foss. Hymen., p. 133.

I had a pair of this insect, captured in Coaver Garden, the seat of John Milford, Esq., Exeter, in June, 1858. The male has, I am sorry to say, got destroyed.

PODAGRICUS, *Van der Lind*.

Shuckard, Foss. Hymen., p. 157; *Smith*, Brit. Foss. Hymen., p. 134.

Not very common with us, at least I have not seen many specimens. Mr. F. Smith captured it on High Peak, Sidmouth.

WESMAELI, *Van der Lind*.

Shuckard, Foss. Hymen., p. 164; *Smith*, Brit. Foss. Hymen., p. 136.

By no means a common species. I have taken it in the Exeter district in August.

MACULATUS, *Fabr*.

Shuckard, Foss. Hymen., p. 147; *Smith*, Brit. Foss. Hymen., p. 142.

Captured in June, 1857, in Mr. Ross's garden at Topsham. They are fond of basking in the sun on the leaves of plants. Taken also at Plymouth by Mr. Bignell.

VAGABUNDUS, *Panzer*.

Shuckard, Foss. Hymen., p. 149; *Smith*, Brit. Foss. Hymen., p. 141.

Taken, in August, 1872, on High Peak, Sidmouth, by Mr. F. Smith.

SCUTATUS, *Fab*.

Shuckard, Foss. Hymen., p. 129; *Smith*, Brit. Foss. Hymen., p. 143.

Mr. S. Stevens captured this species in Devonshire.

CEPHALOTES, *Panz*.

Shuckard, Foss. Hymen., p. 135; *Smith*, Brit. Foss. Hymen., p. 147.

Apparently scarce. Taken in marshes near St. Mary's Clyst, in August, burrowing in decayed willows by the side of the river; at High Peak, Sidmouth; and on the coast of North Devon.

CRIBRARIUS, *Linn*.

Shuckard, Foss. Hymen., p. 126; *Smith*, Brit. Foss. Hymen., p. 149.

Taken at Plymouth by Mr. J. J. Reading, and at Sidmouth, and in North Devon.

VAGUS, Linn.

Shuckard, Foss. Hymen., p. 145 ; *Smith*, Brit. Foss. Hymen., p. 155.

Captured burrowing into some old posts in the marshes at Topsham, in June ; and Mr. Smith took specimens on Woolacombe Sands, North Devon.

CHRYSOTOMUS, St. Farg.

Shuckard, Foss. Hymen., p. 139 ; *Smith*, Brit. Foss. Hymen., p. 156.

I bred this in some numbers from pupæ dug out of decayed willows, in the marshes, at St. Mary's Clist, 1858.

LINDENIUS, Shuckard.

Foss. Hymen., p. 142 ; *Smith*, Brit. Foss. Hymen., p. 157.

Captured near Sandy-gate, Clist St. Mary, in July.

BREVIS, Van der Lind.

Shuckard, Foss. Hymen., p. 169 ; *Smith*, Brit. Foss. Hymen., p. 160.

I have a specimen from the Raddon collection, I believe to have been taken in North Devon.

GENUS, **OXYBELUS, Latreille.****UNIGLUMIS, Linn.**

Shuckard, Foss. Hymen., p. 107 ; *Smith*, Brit. Foss. Hymen., p. 162.

Not common. Captured on Braunton Burrows, and at Exmouth, in June. Mr. Smith took specimens, in August, on High Peak, Sidmouth.

NIGRIPES, Oliv.

Shuckard, Foss. Hymen., p. 109 ; *Smith*, Brit. Foss. Hymen., p. 164.

Very rare ; two specimens only are known, one of which is in the British Museum, and the other was captured by Mr. S. Stevens, in Devonshire.

NOTATUS, Jurine.

Shuckard, Foss. Hymen., p. 112 ; *Smith*, Brit. Foss. Hymen., p. 165.

I have one specimen, a female. It was presented to me by the purchaser of the Raddon collection. I presume, therefore, that the specimen was captured in North Devon. It must be exceedingly rare, as there is only one specimen in the British Museum.

GENUS, **SPILOMENA, Shuckard.****TROGLODYTES, Van der Lind.**

Shuckard, Foss. Hymen., p. 182 ; *Smith*, Brit. Foss. Hymen., p. 168.

Taken in Coaver Garden, on a pear leaf, June, 1858. Captured also by Mr. Bignell, of Plymouth.

GENUS, *DIODONTUS*, *Curtis*.*MINUTUS*, *Fabr.**Shuckard*, Foss. Hymen., p. 185; *Smith*, Brit. Foss. Hymen., p. 170.

Taken by Mr. Smith on High Peak, Sidmouth, August, 1872.

LUPERUS, *Shuckard*.Foss. Hymen., p. 186; *Smith*, Brit. Foss. Hymen., p. 171.

These little insects delight in basking in the hot sunshine on the leaves of plants. My specimens of this species I captured sitting on the leaves of roses, in Coaver Garden, Exeter, in June, 1861.

TRISTIS, *Van der Lind*.*Shuckard*, Foss. Hymen., p. 187; *Smith*, Brit. Foss. Hymen., p. 172.

I captured this species at Fordlands, near Ide, in July, 1857, and at Christow. It appears to be generally distributed; it burrows in old posts and rails, and also into bramble twigs.

GENUS, *PASSALÆCUS*, *Shuckard*.*BREVICORNIS*, *Thoms*.*Shuckard*, Foss. Hymen., p. 189; *Smith*, Brit. Foss. Hymen., p. 173.

Captured entering burrows in old posts, near the Old Abbey, Exeter, August, 1857.

GRACILIS, *Curtis*.*Shuckard*, Foss. Hymen., p. 190; *Smith*, Brit. Foss. Hymen., p. 174.

Caught coming out of a hole in a post of the seventh stile in the footpath fields near Millbrook, leading to Countess Weir, July 23rd, 1857. Apparently rare.

CORNIGERA, *Shuck*.Foss. Hymen., p. 191; *Smith*, Brit. Foss. Hymen., p. 174Captured in the same post as *gracilis*, and at the same time. This appears also to be scarce. Taken on High Peak, Sidmouth, by Mr. F. Smith.GENUS, *PEMPHREDON*, *Latreille*.*LUGUBRIS*, *Fabr.**Shuckard*, Foss. Hymen., p. 196; *Smith*, Brit. Foss. Hymen., p. 175.

Captured in the Exeter district in June. It burrows in old posts and rails, and is tolerably plentiful in hot dry seasons. This species has the petiole rugosely punctured, and a pale yellow spot on the inside of the posterior tibia at its apex.

GENUS, **CERATOPHORUS**, *Shuckard*.**ANTHRACINUS**, *Smith*.

Brit. Foss. Hymen., p. 177.

I have never seen this insect. Mr. Smith has a specimen, but he has some hesitation in regarding the insect as a distinct species, from insufficient specimens to found it on. At the same time he considered that more specimens would be found to confirm it a species. The specimen on which this is founded was captured in Devonshire.

GENUS, **GEMONUS**, *Jurin*.**UNICOLOR**, *Latr*.

Shuckard, Foss. Hymen., p. 200; *Smith*, Brit. Foss. Hymen., p. 178.

This is a common insect, and generally distributed. It is very fond of basking in the sun in the height of summer.

LETHIFER, *Shuck*.

Foss. Hymen., p. 201; *Smith*, Brit. Foss. Hymen., p. 179.

This little species makes its nest in bramble and rose sticks; they take advantage of the dead end of a branch, and excavate a hole in the pith; when sufficiently deep the female lays an egg; a number of aphides are then collected and placed with this, then another egg is laid; and more aphides, and so on until the hole is filled. It is generally distributed.

GENUS, **PSEN**, *Latreille*.**PALLIPES**, *Panz*.

Shuckard, Foss. Hymen., p. 227; *Smith*, Brit. Foss. Hymen., p. 181.

I bred this little species from bramble sticks, in June, 1858. It is a generally distributed species.

Family, **PHILANTHIDÆ**, *Dalb*.GENUS, **CERCERIS**, *Latreille*.**ARENARIA**, *Linn*.

Shuckard, Foss. Hymen., p. 233; *Smith*, Brit. Foss. Hymen., p. 190.

I first captured this fine insect at St. Mary's Clist, August 25, 1858; since then I have taken several others. One specimen I captured on Prawle Point, August 4th, 1877, feeding on the nectar in the flowers of *Scilla autumnalis*, which is abundant on this high rocky point. It has also been captured at Plymouth by Mr. Bignell.

LABIATA, *Fabr*.

Shuckard, Foss. Hymen., p. 236; *Smith*, Brit. Foss. Hymen., p. 191.

Captured on High Peak by Mr. F. Smith, August, 1872.

QUINQUEFASCIATA, *Rossi*.

Shuckard, Foss. Hymen., p. 238; *Smith*, Brit. Foss. Hymen., p. 192.

I captured three specimens of this on the flowers of the *Scilla autumnalis*, on Prawle Point, August 4, 1877. These are the only Devon specimens I have seen.

ORNATA, *Fabr.*

Shuckard, Foss. Hymen., p. 239; *Smith*, Brit. Foss. Hymen., p. 193.

This very beautiful and distinct species I have not taken myself; but I have a specimen that was presented to me by Mr. J. J. Reading, who took it in the Plymouth district.

Tribe, DIPLOPTERA, *Latreille*.

Family, EUMENIDÆ, *Westwood*.

GENUS, ODYNERUS, *Latreille*.

SINUATUS, *Fabr.*

Curtis's Brit. Insects, l. 138; *Smith*, Brit. Foss. Hymen., p. 201.

Not common. Captured in the Exeter district in June.

GRACILIS, *Brullé*.

Smith, Brit. Foss. Hymen., p. 202.

This does not appear to be frequent with us, at least I have met with it once only, at Christow, on July 12, 1858.

SPINIPES, *Linn.*

Shuckard, in Loud. Mag. Nat. History, N. S. 1, 490 1; *Smith*, Brit. Foss. Hymen., p. 203.

I met with a large colony of this species at Fordlands, near Ide, in July, 1858. They had taken possession of the end of a clay bank, in which they had excavated holes for their nests. In addition to these, each hole was protected by a curved tube, the mouth of the tube being downwards. These tubes were from half-an-inch to an inch long, and were constructed of small pellets of clay. The pellets, being more or less angular, were not pressed close together, but left little interstices between the angles; so that the tubes formed a sort of lattice-work. This rendered them much lighter than they would be had the insects built up a solid tube-way; and not only this, but it allowed the air to have free play through the structure, which no doubt was advantageous to the inmates of the nests. The parent insects were very busy collecting small green caterpillars from an adjoining grass-field for the supply of their larvæ.

PARIETUM, Linn.

Donovan, Brit. Insecta, vol. xiv., p. 495, fig. 1; *Smith*, Brit. Foss. Hymen., p. 206.

This is a common and widely-distributed species, and may be seen flitting about hot walls and hedge-banks in July and August.

QUADRATUS, Panz.

Smith, Brit. Foss. Hymen., p. 207.

This is one of the most variable insects as regards size that one can imagine. There is great difference of opinion as to the distinctness of this insect from the above species. They certainly run very close. This has a black quadrate spot descending from the base of the abdomen into the yellow fascia on the first segment; but it is a somewhat variable character. At the same time, it is as constant as any character that can be pointed out to separate the two doubtful species. This insect is more common than *Parietum*, and appears at the same time.

PICTUS, Curtis.

British Insecta, vol. iii., p. 138; *Smith*, Brit. Foss. Hymen., p. 209.

This would seem to be a rare species with us. I have only seen two or three specimens.

TRIMARGINATUS, Zett.

Smith, Brit. Foss. Hymen., p. 209.

This was taken by Mr. Smith at Budleigh. It would seem to be very scarce.

Family, VESPIDÆ, *Leach*.

GENUS, VESPA, *Linnaeus*.

VULGARIS, Linn. Common Wasp.

Donovan, Brit. Ins. vol. vii., pl. 266; *Smith*, Brit. Foss. Hymen., p. 215.

Very common everywhere in warm summers. The one of 1879 being so very wet and cold all through, up to the beginning of October, very few of these insects had been seen. This year (1880) this insect has literally swarmed everywhere. One gentleman near Ashburton had thirty nests destroyed within a quarter of a mile of his house; and one living near Exeter had fifteen nests destroyed in two fields adjoining his house.

I have a variety, a female, in which both the varieties described by Mr. Smith as A and B, are combined; that is, the black dots on the abdominal segments are united to the black band on all the segments, and the line on the clypeus is without the angular termination.

GERMANICA, *Fabr.*

Smith, Brit. Foss. Hymen., p. 216.

This fine insect is rather plentiful with us in warm seasons, though not so abundant as *V. vulgaris*.

I have a variety of the worker, with a very distinct arrow-headed black mark on each of the abdominal segments, projecting from and attached to each black band.

RUFA, *Linn.* *The Rufous Wasp.*

Curtis, Brit. Entom., t. 760; *Smith*, Brit. Foss. Hymen., 217.

This is a very uncommon species, so far as my observation goes. I have a pair that were captured in Mr. D'Orville's garden, at Alphington. Taken also at Plymouth.

SYLVESTRIS, *Scop.* *The Wood Wasp.*

Smith, Brit. Foss. Hymen., p. 219.

This appears to be a generally distributed species with us. Nests are occasionally taken in trees about Powderham, and specimens have been taken all along both the north and south coasts.

NORVEGICA, *Fabr.*

Leach, Zool. Miscell., vol. i., t. 50, p. 111; *Smith*, Brit. Foss. Hymen., p. 220.

I obtained a good set of specimens of this species from a nest built in a gooseberry-bush, in Mr. D'Orville's garden at Alphington, in 1866. Specimens from the same nest vary a good deal in the markings on the abdomen, but they all retain the peculiar anchor-shaped mark on the clypeus. The figures in *Leach's Zoological Miscellany*, referred to above, are very characteristic of the insects and their nest. Dr. Leach records a variety (B) with "*tibiis posticis macula nigra*." The female I got from the above nest has a macula on the inside of all the tibia, whereas the males and workers from the same nest are free from these marks.

CRABRO, *Linn.* *Common Hornet.*

Donovan, Brit. Insecta, vol. xiv., t. 502; *Smith*, Brit. Foss. Hymen., p. 221.

This formidable and somewhat dangerous insect is sparsely distributed over the county. As everyone wages war against it, it is consequently kept in comparative subjection.

Tribe, ANTHOPHILA, *Latreille*.

Family, ANDRENIDÆ, *Leach*.

Sub-family, OBTUSILINGUES, *Westwood*.

GENUS, COLLETES, *Latreille*.

SUCCINCTA, *Linn.*

Kirby, Mon. Apum Ang., p. 32, No. 1; *Smith*, Bees of Gt. Brit. p. 3.

This is a widely distributed species. I have taken it at Barnstaple and in the Exeter district in July and August, and Mr. Smith captured it on High Peak, Sidmouth.

FODIENS, *Kirby*.

Mon. Apum Ang., vol. ii., t. 15, fgs. 1, 2, No. 2; *Smith*, Bees of Gt. Brit., p. 4.

This species is difficult to separate from the former, as the size and colouration are almost exactly alike, especially after they have been exposed to the sun a short time. The coarseness of the puncturing on the abdomen of this as compared with the above is almost the only mark of distinction, but in some specimens this distinction almost fails.

DAVIESANA, *Kirby*.

Smith, Bees of Gt. Brit., p. 6; Brit. Bees, p. 5.

Captured by Mr. Smith, on High Peak, Sidmouth, in August, 1872.

The parasites of this species are *Epeolus variegatus* and *Chrysis ignita*.

GENUS, PROSOPIS, *Fabricius*.

COMMUNIS, *Nylander*.

Kirby, Mon. Apum Ang., vol. ii., t. 15, f. 3; *Smith*, Bees of Gt. Brit., p. 8.

A very widely distributed insect, taken in June and July. The species composing this genus are, perhaps, the most difficult to separate of the whole of our British Hymenoptera.

PUNCTULATISSIMA, *Smith*.

Brit. Bees., 2nd Ed. 1876, p. 10.

This does not appear to be a common species. I have taken it near Clist St. Mary, in July; two specimens had alighted on an old post.

SIGNATA, *Nylander*.

Kirby, Mon. Apum Ang., vol. ii., p. 41, No. 6; *Smith*, Brit. Bees, 2nd ed., p. 11.

I captured this species some years ago, but I did not note the locality; I believe it was in the Exeter district.

HYALINATA, *Smith*.

Brit. Bees, 2nd. ed., p. 12.

Captured on the flowers of *Scilla autumnalis*, which grow in abundance on Prawle Point, August 3rd, 1879. Mr. Smith has taken it on High Peak, Sidmouth, also in August, and Mr. Bignell in the Plymouth district.

{ BREVICORNIS, *Nylander*.
{ PERFORATOR, *Smith*.

Brit. Bees, 2nd ed., p. 13.

Captured in flowers in Coaver Garden, the seat of J. Milford, Esq., Exeter, June, 1857. Taken by Mr. Smith at Sidmouth.

VARIEPES, *Smith*.

Bees of Gt. Brit., p. 12.

This is a very rare species. I have never taken it myself, but there are specimens in the British Museum from Devonshire.

RUPESTRIS, *Smith*.

Brit. Bees, 2nd. ed., p. 14.

This was discovered at Sidmouth, in August, 1872. I have not seen this insect. Mr. Smith pronounced it distinct, but Mr. E. Saunders regards it only as a variety of *communis*.

VARIEGATA, *Fabr.*

Smith, Bees of Gt. Brit., p. 14.

This is an extremely rare insect. There are three specimens in the British Museum, said to have been taken by Dr. Leach at Kingsbridge; and Mr. Smith found a female in a collection of Hymenoptera, taken in the neighbourhood of Bideford. This species, with the following, is now disputed (see *Entomologist's Monthly Magazine*, vol. xvi., p. 39) as being indigenous to this country.

BIFASCIATUS, *Jurin*.

Smith, Bees of Gt. Brit., 2nd ed., p. 15.

The only British example, so far as is known, is in the British Museum; it has on it a label with *Bantham* written on it, and is consequently considered to have been taken there by Dr. Leach, or perhaps Colonel Montague, who lived at Kingsbridge, and collected objects of natural history most assiduously for many years.

Sub-family, ACUTILINGUES, *Westwood*.
GENUS, *SPHECODES*, *Latreille*.

GIBBUS, Nylander.

Smith, Bees of Gt. Brit., 2nd Ed., p. 17; *Kirby*, Mon. Apum Ang., vol. ii., p. 46, No. 9.

I captured many specimens of this species. They were flying amongst a colony of *Halictus morio*; they also went in and out the holes in the hedge-bank the same as the bees. From what I then saw I considered the *Sphecodes* a parasite on the *Halictus*; but Mr. Smith, having studied a mixed colony similar to the one I saw, is pretty nearly convinced that the *Sphecodes* is not a parasite; at the same time, this remains an open question. The species is generally distributed, on warm banks and flowers, in July and August.

RUFIVENTRIS, Westm.

Kirby, Mon. Apum Ang., vol. ii., p. 42 (*M. gibba*); *Smith*, Bees of Gt. Brit., 2nd ed., p. 18.

This is a very generally distributed insect, but more especially in warm sandy districts. I have taken it on May 28th; this would be from an egg laid the previous autumn. There is another brood hatched in August.

SUBQUADRATUS, Smith.

Bees of Gt. Brit., p. 18; *Smith*, Brit. Bees, 2nd ed., p. 19.

I captured this pretty species at Exmouth, on August 8th, 1858. It does not appear to be very frequent with us. It is considered a very local and rare insect. I was fortunate enough to capture both males and females.

CONNEXA, Parfitt.

Head and thorax, black, finely punctured, apex of clypeus yellow, mandibles black, face clothed with silvery hairs, scape and first joint of the antennæ black, the flagellum rufo-piceous beneath, black above, except the apical joint, which is piceous.

Thorax black, shining, sparsely punctured, the metathorax having a semi-circular enclosed space rugoso-punctate.

Wings hyaline, slightly iridescent, the nervures and stigma testaceous, the tegulæ pale testaceous.

Legs, the anterior coxia and femora in front black, all the rest rufo-piceous, the tarsi pale yellowish, all clothed with rather long coarse silvery hairs.

Abdomen short, ovate, very finely punctured, entirely dark rufo-piceous, and thinly clothed with pale hairs.

Length, 2½ lines.

The head is not so wide on the vertex as *subquadratus*, and falls away at an angle towards the base of the antennæ. The yellow apex to the clypeus, the shorter and more ovate abdomen, its rufo-piceous colouring, would seem to pronounce this a distinct species. But having only one specimen, which has been seen by Mr. E. Saunders, who does not know it, but thinks it may probably be a black variety of *subquadratus*, I therefore name it provisionally, *Connexa*, as being closely allied to the above species.

Captured at Fordlands, near Ide, in June, a few years ago.

EPHIPPIA, *Linn.*

Kirby, Mon. Apum Ang., vol. ii., t. 15, f. 5 (female); *Smith*, Bees of Gt. Brit., 2nd ed., p. 20.

I captured this pretty little species, according to my notes, entering the burrows of *Halictus*, in June and July. I have taken specimens also at Exmouth and Sidmouth.

GENUS, *HALICTUS*, *Latreille*.

RUBICUNDUS, *Nylander*.

Kirby, Mon. Apum Ang., vol. ii., p. 53, No. 14; *Smith*, Brit. Bees, 2nd ed., p. 79.

This is a widely-distributed species. I have taken the female on May 8th, and both males and females in July, in abundance, on an old bank near the Old Abbey, in the footpath fields leading to Countess Weir.

XANTHOPUS, *Brullé*.

Kirby, Mon. Apum Ang., vol. ii., p. 78, No. 34; *Smith*, Brit. Bees, 2nd ed., p. 81.

This is not a common insect. I have taken it in the Exeter District.

LEUCOZONIUS, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 76, No. 33; *Smith*, Brit. Bees, p. 83.

Generally distributed; the nests in warm hedge-banks. Both males and females in July.

LUGUBRIS, *Kirby*.

Mon. Apum Ang., vol. ii., p. 81, No. 36; *Smith*, Brit. Bees, p. 83.

Rather a common species. I have taken the female on April 10th, and the males on the 4th May, at Fordlands, near Ide. They were abundant there in 1857.

ZONULUS, *Smith*.

Bees of Gt. Brit., p. 26; Brit. Bees, 2nd ed., p. 84.

This is a rare species, so far as I have been able to ascertain. The only places that it has occurred to me are Fordlands, near Ide, and at Exmouth, in August. Mr. F. Smith took it in North Devon.

SEXNOTATUS, *Walck*.

Kirby, Mon. Apum Ang., vol. ii., p. 82, t. 16, figs. 7, 8; *Smith*, Brit. Bees, 2nd ed., p. 84.

This is very rare. I have one specimen only, captured at Exmouth on August 8th, 1858.

QUADRINOTATUS, *Kirby*.

Mon. Apum Ang., vol. ii., p. 79, No. 35; *Smith*, Brit. Bees, 2nd ed., p. 85.

This is a very uncommon species. Mr. F. Smith has taken it on High Peak, Sidmouth; and I have half a dozen specimens captured at various places in the county. I took a female this year, 1880, March 30th. Mr. Bignell takes it at Plymouth.

MACULATUS, *Smith*.

Bees of Gt. Brit., p. 29; Brit. Bees, 2nd ed., p. 86.

This is an extremely rare bee. I have one specimen only, a male, which I submitted to Mr. Smith for his opinion on it. He said he believed it was the male of *H. maculatus*. It differs only from the description in having the tibia dark rufo-piceous, the same as the coxia and femora, instead of being yellow; the tarsi are yellow. The abdomen is sparsely clothed with yellowish hairs, rather thicker on the sides and apex; but it has no lines of white pubescence on the segments, as described. The abdomen is rufo-testaceous, the margins of the segments paler, the basal segment is very highly polished and impunctate, the rest very minutely punctured and shining.

I took this specimen at Fordlands, near Ide, on June 18th, 1857.

INTERRUPTUS, *Panz*.

Smith, Bees of Gt. Brit., p. 43, 2nd ed., p. 87.

Extremely rare. There is a specimen in the British Museum, with a label on which is written "Kingsbridge." This was probably taken by Dr. Leach or Col. Montague.

CYLINDRICUS, Fabr.

Kirby, Mon. Apum Ang., vol. ii., p. 68, Nos. 28-30; *Smith*, Brit. Bees of Gt. Brit., p. 30; 2nd ed., p. 87.

One of the commonest of the whole genus, and widely distributed. Appearing from May to September.

The following varieties are not uncommon:

Var. A.—With a black spot in the centre of the second and third segments.

Var. B.—With a broad fuscous stain on the second and third segments, leaving only the margins red.

Var. G.—The apical margins alone red, or faintly so in the middle.

ALBIPES, Fabr.

Kirby, Mon. Apum Ang., vol. ii., pp. 71-75, Nos. 29-31; *Smith*, Brit. Bees, p. 89.

I have not taken this species in the Exeter district; but I have it from Prawle Point, where it was feeding on the nectar contained in the flowers of *Scilla autumnalis*, in August. Mr. Smith captured specimens in North Devon, in 1870, and Mr. Bignell has taken it at Plymouth.

VILLOSULUS, Kirby.

Mon. Apum Ang., vol. ii., pp. 62-66, Nos. 21-25; *Smith*, Brit. Bees, p. 91.

A widely-distributed species. Numbers of specimens were busy in the flowers of the dandelion in a grass-field near Dawlish, October 26th, 1878, both males and females. Taken also by Mr. Smith in North Devon.

TUMULORUM, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 55 (male), No. 15; *Smith*, Brit. Bees, p. 93.

Captured at Fordlands, May 26th, 1857; High Peak, Sidmouth, by Mr. Smith. I have taken it at Dawlish, Torquay, and North Devon.

GRAMINEUS, Smith.

Brit. Bees, p. 95.

I have not taken this species myself; but there are several specimens in the British Museum said to have been taken in Devonshire.

SMEATHMANELLUS, Kirby.

Mon. Apum Ang., vol. ii., App. p. 375, No. 111; *Smith*, Brit. Bees, p. 95.

Captured at Fordlands on May 16th; and Mr. Smith has taken it on High Peak in August, and on Branton

Burrows, North Devon. Mr. Bignell takes it at Plymouth.

ÆRATUS, Kirby.

Mon. Apum Ang., vol. ii., p. 68, No. 17; *Smith*, Brit. Bees, p. 96.

On the blossoms of the laurel at Fordlands on May 4th, and again in July on other flowers, but not common.

MORIO, St. Farg.

Kirby, Mon. Apum Ang., vol. ii., p. 60, No. 19; *Smith*, Brit. Bees, p. 97.

The most abundant of the whole group; burrows in dry hedge-banks exposed to the sun. Taken April 15th, and again in September.

LEUCOPUS, Kirby.

Mon. Apum Ang., vol. ii., p. 69, No. 18; *Smith*, Brit. Bees, p. 97.

This species appear to be very local and scarce. I took a specimen, on August 8th, 1858, at Exmouth.

MINUTUS, St. Farg.

Kirby Mon. Apum Ang., vol. ii., p. 61, No. 20; *Smith*, Brit. Bees, p. 100.

There was some years ago a very large colony of this species in an old hedge-bank near the Old Abbey, Exeter, from which I obtained my specimens; but it is a very generally distributed insect in both North and South Devon.

NITIDIUSCULUS, Kirby.

Mon. Apum Ang., vol. ii., p. 64, No. 23; *Smith*, Brit. Bees, p. 101.

This is a widely distributed species, and not uncommon both in the north and south of the county.

MINUTISSIMUS, Kirby.

Mon. Apum Ang., p. 63, No. 22; *Smith*, Brit. Bees, p. 102.

I am inclined to regard this little bee as very scarce with us; at least this is my experience. I have never met with more than one small colony of it, and that was on a warm hedge-bank near the Salmon Pool below Exeter.

GENUS, *ANDRENA, Fabricius.*

HATTORFIANA, Fabr.

Kirby, Mon. Apum Ang., vol. ii., p. 83, No. 38; *Smith*, Bees of Gt. Brit., p. 60, 2nd ed. p. 26.

This handsome insect has been taken about Dawlish and Teignmouth, in July and August, and, as remarked by Mr. Smith, it is partial to the flowers of the wild scabious.

AUSTRIACA, *Panz.*

Kirby, Mon. Apum Ang., vol. ii., p. 83, No. 39 (*M. rosæ*); *Smith*, Brit. Bees, p. 27.

This beautiful bee is sparsely and widely distributed over the entire county, appearing in August. In 1862 it was rather abundant at Fordlands, near the pond.

SPINIGERA, *Kirby.*

Mon. Apum Ang., vol. ii., t. 15, fig. 10, p. 123, No. 63; *Smith*, Bees of Gt. Brit. p. 52 (*A. eximia*).

A widely distributed species, appears as early as April 26th; and on the 4th May, 1857, the females were abundant on the blossoms of the laurel at Fordlands, near Ide. The males were scarce, not one to a hundred females.

Var. A.—The apical margins of the first and second segments of the abdomen red.

Var. B.—The margin very narrowly rufo-piceus.

Var. G.—Abdomen black.

These varieties, as enumerated by Mr. Smith, were taken at Fordlands.

DECORATA, *Smith.*

Bees of Gt. Brit. p. 55; Brit. Bees, p. 29.

I have taken this species near the Old Abbey and at Fordlands on July 16th. It is not a common species.

Var. B.—The apical margins of the first and second segments red.

This variety I have taken at Exmouth, on bramble blossoms, in August.

FLOREA, *Fabr.*

Kirby, Mon. Apum Ang., vol. ii., p. 85 (*var. D. rosæ*, of *Kirby*); *Smith*, Brit. Bees, p. 30.

A widely distributed species, being found in both north and south of the county, in May and July.

CETII, *Schrank.*

Kirby, Mon. Apum Ang., vol. ii., p. 9, No. 42 (*M. Schrankella*); *Smith*, Brit. Bees, p. 31.

I have not taken this species myself; but Mr. Smith captured specimens in the fields, and by the roadside beyond Watermouth, on the cliff road, just before the steep descent into Coombe Martin, North Devon.

CINGULATA, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 88, No. 41; *Smith*, Bees of Gt. Brit., p. 57, 2nd ed., p. 32.

This pretty little bee is not common. I have taken it in the Exeter district in the early part of May, both males and females.

CINERARIA, *Linn.*

Kirby, Mon. Apum Ang., vol. ii., p. 98, No. 47; *Smith*, Brit. Bees, p. 33.

A very generally distributed species, appearing about the end of May. This is one of the prettiest of our British bees, and may be seen sitting on warm pathways, a very favourite place for it.

PILIPES, *Fabr.*

Kirby, Mon. Apum Ang., vol. ii., p. 96, No. 46; *Smith*, Brit. Bees, p. 34.

I have a specimen that was taken by Captain Bloomer in South Devon, and Mr. Smith has taken it on High Peak, Sidmouth, and Mr. Dale at Budleigh Salterton, in August. It frequents the heads of thistles.

THORACEA, *Fabr.*

Kirby, Mon. Apum Ang., vol. ii., pp. 101, 103, Nos. 49, 50; *Smith*, Brit. Bees, p. 35, 2nd ed., p. 34.

A widely but sparsely distributed species. It is found in both the north and south of the county in May.

NITIDA, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 104, No. 51; *Smith*, Brit. Bees, p. 35, 2nd ed., p. 35.

Very generally distributed, and common in April and May.

VITREA, *Smith.*

Bees of Gt. Brit. p. 62, 2nd ed., p. 35.

Mr. Smith has taken this local species on High Peak, Sidmouth, on the flowers of the bramble, in August.

ALBICANS, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 94, No. 45; *Smith*, Brit. Bees, p. 37.

Generally distributed, and very common. I have taken specimens as early as March.

FULVA, *Schrank.*

Kirby, Mon. Apum Ang., vol. ii., p. 128, No. 68; *Smith*, Bees of Gt. Brit., p. 64.

This would seem to be a scarce species with us. I have not seen the insect in Devon myself, but Mr. Bignell includes it in a list of Aculeate Hymenoptera, captured by himself in the Plymouth district.

GWYNANA, Kirby.

Mon. Apum Ang., vol. ii., p. 120, No. 60; *Smith, Brit. Bees.*, p. 40.

Taken at Dunsford, March 30th. Plymouth, and in the Exeter district. It appears to be generally distributed.

BICOLOR, Fabr.

Kirby, Mon. Apum Ang., vol. ii., p. 164 (*M. pilosula*); *Smith, Brit. Bees.* p. 41.

I have taken this at Christow, Fordlands, and between Dartmouth and Brixham, on the cliffs, April 10th, and near the Old Abbey, Exeter, in June.

VARIANS, Rossi.

Kirby, Mon. Apum Ang., vol. ii., p. 117, No. 58; *Smith, Brit. Bees.*, p. 43.

A somewhat generally distributed species. I have taken it at Newton, Fordlands, towards the end of May. Captured also at Plymouth by Mr. Bignell.

ATRICEPS, Kirby.

Mon. Apum Ang., vol. ii., p. 114, No. 55; *Smith, Bees of Gt. Brit.*, p. 70.

This, so far as my experience goes, is by no means a common species with us. I have taken it at Countess Weir in May; and Mr. Bignell at Plymouth.

NIGRO-ÆNEA, Kirby.

Mon. Apum Ang., vol. ii., p. 109, No. 54; *Smith, Bees of Gt. Brit.*, p. 71, 2nd ed., p. 46.

This is a common species, and widely distributed. It is very partial to the flowers of *Reseda luteola* in July.

TRIMMERANA, Kirby.

Mon. Apum Ang., vol. ii., p. 116, No. 57; *Smith, Bees of Gt. Brit.*, p. 72, 2nd ed., p. 46.

This is also a widely distributed species. I have taken it in different parts of the county in April and August.

PICICORNIS, Kirby.

Mon. Apum Ang., vol. ii., p. 123, No. 62; *Smith, Bees of Gt. Brit.*, p. 75, 2nd ed., p. 47.

I am inclined to regard this as a very scarce insect. It does not bear any very distinctive marks to distinguish it; but still, when compared with allied species, the practised eye detects a difference. I have compared a specimen I took at Exmouth, on bramble blossoms, August, 1858, with a pair I had from Mr. Walcot, of Clifton, the well-known Hymenopterist.

SMITHELLA, Kirby.

Mon. Apum Ang., vol. ii., p. 131, No. 70; *Smith, Bees of Gt. Brit.*, p. 76, 2nd ed., p. 48.

Apparently very rare. I have a specimen captured at Sidmouth in July, 1859.

NIGRICEPS, Kirby.

Mon. Apum Ang., vol. ii., p. 134, No. 73; *Smith, Bees of Gt. Brit.*, p. 78, 2nd ed., p. 50.

I have not taken this myself, but Mr. Smith captured specimens on the flowers of the blackberry, at Morthoe, North Devon, 1870.

ANGUSTIOR, Kirby.

Mon. Apum Ang., vol. ii., p. 122, No. 61; *Smith, Bees of Gt. Brit.*, p. 80.

This species has been taken by Mr. Bignell in the Plymouth district, but so far it has not fallen to my net.

DENTICULATA, Kirby.

Mon. Apum Ang., vol. ii., p. 133, No. 72; *Smith, Bees of Gt. Brit.*, p. 81, 2nd ed. p. 53.

Mr. Smith captured this species on flowers of the Ragwort, by the roadside, at the village of Hele, near Berrynarbor, North Devon; and also on High Peak, Sidmouth, in August. I captured specimens at Fordlands in July, 1864. It would appear from this that the bee is widely distributed over the county.

FUCATA, Smith.

Bees of Gt. Brit., p. 82, 2nd ed., p. 54.

Extremely rare. I have one specimen only; it was compared and named for me by Mr. Smith, but I am sorry to say that in its transit by post it was badly damaged.

FULVICRUS, Kirby.

Mon. Apum Ang., vol. ii., p. 138, No. 77; *Smith, Bees of Gt. Brit.*, p. 86, 2nd ed., p. 57.

Taken on bramble blossoms at Exmouth in 1858. In 1877 the females were abundant on the flowers of the blackthorn on the cliffs beyond Exmouth, on March 30th, and I have taken the same sex again in July and August.

EXTRICATA, Smith.

Bees of Gt. Brit., p. 87, 2nd ed., p. 58.

I have two females of what I believe to be this species. They were captured on the south coast. I did not mark the date, as I regarded them as pale specimens of "*fulvicrus*."

FULVAGO, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 93, No. 44; *Smith*, Bees of Gt. Brit., p. 88, 2nd ed., p. 69.

This is not an uncommon species in the Exeter district in May and June. The bees are especially fond of the flowers of the common dandelion, in which they almost bury themselves in collecting the pollen. It is taken also in the Plymouth district.

FULVESCENS, *Smith.*

Bees of Gt. Brit., p. 89, 2nd ed. p. 60.

Not very common. I have taken it at Plymouth, and the females near the Old Abbey on 20th June. Fordlands is also a good habitat for this species.

BUCEPHALA, *Stephens.*

Bees of Gt. Brit., p. 90, 2nd ed., p. 60; *Stephens*, Supp. Man. vol. vii., t. 43, f. 6.

I believe this to be a very rare bee with us. I captured a female at Fordlands on June 6th, 1858, and I have not seen one since.

ALBICRUS, *Kirby.*

Mon. Apum Ang., vol. ii., p. 156, No. 96; *Smith*, Bees of Gt. Brit., p. 91, 2nd ed., p. 61.

This is rather a rare species. The only places where I have taken it is near the Old Abbey, Exeter, May 26th, and in a lane leading from Sandy Gate to Whipton, June 7th, 1877. There was a small colony mixed with the following species. Mr. Bignell takes it in the Plymouth district.

LABIALIS, *Kirby.*

Mon. Apum Ang., vol. ii., p. 148, No. 87; *Smith*, Bees of Gt. Brit., p. 92, 2nd ed., p. 62.

I have taken this distinct species in the footpath through the Polsloe Farm; they were basking in the sun on bramble leaves, near the barn. I also met with a colony by the roadside in a lane leading from Sandy Gate to Pinhoe, June 7th, when I captured both males and females.

CHRYSOCELES, *Kirby.*

Mon. Apum Ang., vol. ii., p. 143, No. 82; *Smith*, Bees of Gt. Brit., p. 93, 2nd ed., p. 63.

The only place where I have taken this is Fordlands, near Ide, about the middle of June.

COITANA, Kirby.

Mon. Apum Ang., vol. ii., p. 147, No. 86; *Smith*, Bees of Gt. Brit., p. 94, 2nd ed., p. 64.

Very rare. I have one specimen, captured somewhere in the Exeter district, but I omitted at the time to note the locality. This species would seem to have reached its western limits in Devonshire, as it increases in number from this northwards and eastwards, where it is very common.

PARVULA, Kirby.

Mon. Apum Ang., vol. ii., p. 162; *Smith*, Bees of Gt. Brit., 2nd ed. p. 66 (*nigrifrons*), 1st ed., p. 97.

I captured four specimens of this species at Sidmouth, March 31st, 1863. These are the only Devon specimens I have seen.

MINUTULA, Kirby.

Mon. Apum Ang., vol. ii., p. 161, No. 101; *Smith*, Bees of Gt. Brit., p. 96, 2nd ed. p. 66.

I have taken this little species in May and June at Fordlands, and near the Old Abbey, Exeter. It is not common.

NANA, Kirby.

Mon. Apum Ang., vol. ii., p. 161, No. 102; *Smith*, Bees of Gt. Brit., p. 97, 2nd ed., p. 67.

This appears to be very rare, at least I have never taken but one, which was named for me by Mr. Smith. This was captured on a warm bank, near the Old Abbey, on June 18th, 1857.

DORSATA, Kirby.

Mon. Apum Ang., vol. ii., p. 144, No. 83; *Smith*, Bees of Gt. Brit., p. 97.

A very scarce species. The only place I have seen it is Fordlands, near Ide, on June 18th.

AFZELIELLA, Kirby.

Mon. Apum Ang., vol. ii., p. 169, No. 108; *Smith*, Bees of Gt. Brit., p. 101, 2nd ed. p. 71.

A widely distributed species. Mr. Smith captured it on Salcombe Hill, Sidmouth, in August. I have taken it at Fordlands in June; Mr. Bignell at Plymouth.

CONVEXIUSCULA, Kirby.

Mon. Apum Ang., vol. ii., p. 166, No. 106; *Smith*, Bees of Gt. Brit., p. 102, 2nd ed., p. 72.

This is a rather abundant species with us, frequenting dry hard pathways. This bee, for some unaccountable reason,

is more infested with species of *Stylops* than any other I have seen; frequently the heads of two may be seen projecting from under the rings of the abdomen, especially of the females. This species is taken in May and June.

COLLINSONANA, Kirby.

Mon. Apum Ang., vol. ii., p. 153, No. 93; *Smith*, Bees of Gt. Brit., p. 104, 2nd ed., p. 73.

This very distinct species is rare. The only locality I have taken it is Sidmouth, in August.

XANTHURA, Kirby.

Mon. Apum Ang., vol. ii., p. 164, No. 105; *Smith*, Bees of Gt. Brit., p. 166, 2nd ed., p. 74.

A common species. Captured generally the early part of May; and in August in warm sunny spots.

GENUS, CILISSA, Leach.

HÆMORRHOIDALIS, Fabr.

Kirby, Mon. Apum Ang., vol. ii., p. 172, No. 110; *Smith*, Bees of Gt. Brit., p. 109, 2nd ed., p. 76.

Very rare. I have a specimen captured in the county, but I omitted to mark the locality. Mr. Smith captured specimens in North Devon. I have half a dozen specimens that were presented to me by the late Mr. Walcott, captured near Bristol.

The student will be somewhat thrown off his guard if he relies too much on the formation of the cells in the wings of this species for the identification. The sub-marginal cells, and more especially the third, are sometimes quite square, and the recurrent nerve is received in continuation of the third sub-marginal cell. In others this cell forms a trapezium, and the recurrent nerve is received about one-third from the end of the cell.

GENUS, DASYPODA, Latreille.

HIRTIPES, Fabr.

Kirby, Mon. Apum Ang., vol. ii., p. 174, No. 111; *Smith*, Bees of Gt. Brit., p. 112, 2nd ed., p. 103.

This very beautiful bee is rare with us. I have only seen three or four specimens, two of which were taken on Exmouth Warren by Truscott, the taxidermist, and one I took on Braunton Burrows, in August, 1867. Mr. Bignell has taken it near Plymouth.

Family, APIDÆ, *Leach.*

Sub-family, ANDRENOÏDES, *Latreille.*

GENUS, PANURGUS, *Panzer.*

CALCARATUS, *Scop.*

Kirby, Mon. Apum Ang., vol. ii., p. 178, No. 1; *Smith*, Bees of Gt. Brit., p. 114, 2nd ed., p. 106.

A widely distributed species. I have it from Plymouth, Dawlish, and Budleigh Salterton, but I have not seen it from the north of the county. Taken in August.

BANKSIANUS, *Kirby.*

Mon. Apum Ang., vol. ii., p. 179, No. 3; *Donovan*, Brit. Insecta, vol. xii., t. 403, f. 2; *Smith*, Bees of Gt. Brit., p. 116, 2nd ed., p. 107.

Mr. Smith captured this pretty little species on High Peak, Sidmouth, and also in North Devon. I have taken it at Budleigh Salterton, and on Exmouth Warren, in August.

Sub-family, CUCULINÆ, *Latreille.*

GENUS, NOMADA, *Fabricius.*

RUFICORNIS, *Linn.*

Kirby, Mon. Apum Ang., vol. ii., pp. 186-227, No. 8; *Smith*, Bees of Gt. Brit., p. 118, 2nd ed., p. 110.

A widely distributed species, being found in all parts of the county, in May and August. This insect is parasitic on several species of *Andrena*.

OCHROSTOMA, *Kirby.*

Mon. Apum Ang., vol. ii., p. 209, No. 26; *Smith*, Bees of Gt. Brit., p. 122.

Captured by Mr. Bignell in the Plymouth district.

BOREALIS, *Zett.*

Smith, Bees of Gt. Brit., p. 123, 2nd ed., p. 112.

This is a rare and very handsome species. I have only met with it once, and that was at Fordlands, on April 10th, 1857; it is parasitic on *Andrena Clarkella*. My specimens are two females and a male; the females differ from the type described by Mr. Smith, in having two orange dots on the first or basal segments of the abdomen, just touching the black base; the intermediate tibia have also a black macula behind.

LATHBURIANA, *Kirby.*

Mon. Apum Ang., vol. ii., p. 183, No. 6; *Smith*, Bees of Gt. Brit., p. 125, 2nd ed., p. 117.

Very rare. I have one Devonshire specimen I captured several years ago, but I omitted to mark the locality; it was captured on the 5th May.

FLAVO-GUTTATA, *Kirby*.

Mon. Apum Ang., vol. ii., p. 215, No. 31; *Smith*, *Bees of Gt. Brit.*, p. 128, 2nd ed., p. 213.

This very pretty insect is not uncommon some seasons; but the most abundant I ever saw was in 1858, at Fordlands, on the 6th June. This was the best year for Hymenoptera that I have ever known.

ARMATA, *Schaff*.

Stevens, *Ill. Man.*, vol. vii., t. 44, fig. 1; *Smith*, *Bees of Gt. Brit.*, p. 130, 2nd ed., p. 118.

This species was first added to the British list by Dr. Leach, who captured it in Devonshire. Mr. Stevens also took specimens here, and in 1872 Mr. Smith took it on Salcombe Hill, Sidmouth, and Woolacombe Sands, near Morthoe, North Devon.

XANTHOSTICTA, *Kirby*.

Mon. Apum Ang., vol. ii., p. 212; *Smith*, *Bees of Gt. Brit.*, 2nd ed., p. 121.

Mr. Smith captured this species at Fernwood, near Ilfracombe, near a colony of *Halictus minutus*.

FURVA, *Panz.*

Kirby, *Mon. Apum Ang.*, vol. ii., p. 216, No. 33; *Smith*, *Bees of Gt. Brit.*, p. 132, 2nd ed., p. 122.

Captured flying round the holes of *Halictus morio*, on a warm hedge-bank, near the Old Abby, Exeter. It is a generally distributed species. Taken in June and in August.

RUBRA, *Smith*.

Bees of Gt. Brit., 2nd ed., p. 125.

This unique specimen is in the British Museum collection, and it is supposed to have been captured at or near Kingsbridge.

FABRICIANA, *Linn.*

Kirby, *Mon. Apum Ang.*, vol. ii., p. 213, No. 29; *Smith*, *Bees of Gt. Brit.*, p. 134, 2nd ed., p. 125.

Taken, not uncommon at Fordlands, in June, and Mr. Smith has obtained it on High Peak, Sidmouth, in August.

GERMANICA, *Panz.*

Kirby, *Mon. Apum Ang.*, vol. ii., p. 218, No. 34, t. 16, f. 4; *Smith*, *Bees of Gt. Brit.*, p. 134, 2nd ed., p. 126.

I captured this, on May 23rd, 1853, on flowers, near Exeter;

and on June 26th, at Fordlands. Mr. Smith has taken it at Salcombe ; but it is by no means a common species.

SOLIDAGINIS, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 204, No. 22; *Smith*, Bees of Gt. Brit., p. 136, 2nd ed. p. 127.

This is a widely distributed species, but not common. It has been taken in both North and South Devon. My own specimens were taken on Exmouth Warren in August.

JACOBÆA, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 201; *Smith*, Bees of Gt. Brit., 2nd ed., p. 128.

Mr. Smith says that he once found this species entering the burrows of *Andrena fulvicrus*, in August, at Sidmouth, but he suspects that it is usually parasitic on species of *Halicti*.

LINEOLA, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 190, No. 11; *Smith*, Bees of Gt. Brit., p. 138, 2nd ed. p. 129.

A generally distributed species, but it does not appear to be abundant. Mr. Smith took it at Budleigh, and I have captured it at Fordlands and several other places.

Var. Z.—With the tegulæ ferruginous, the red fascia obscure, and having two black dots.

ALTERNATA, Kirby.

Mon. Apum Ang., vol. ii., p. 182, No. 5; *Smith*, Bees of Gt. Brit., p. 140, 2nd ed., p. 131.

A widely distributed species, appearing early in the season. I have captured it in the beginning of April.

Var. B.—With the basal segment of the abdomen immaculate, and the spots on the scutellum reddish-yellow. I took this at Alphington, in 1874.

SUCCINCTA, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 180, No. 4; *Smith*, Bees of Gt. Brit., p. 142, 2nd ed., p. 132.

This species is found generally distributed, and is one of the spring insects ; that is, I have taken it on the 26th May, and again in July. In 1856 I captured several specimens flying round the holes of the colony of *Halictus morio*, but I do not think the *Nomada* can be parasitic on that species, as it is too large.

GENUS, *EPEOLUS*, Latreille.

VARIEGATUS, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 222, No. 36; *Donovan*, Brit. Ins., vol. xii., t. 399, f. 2; *Smith*, Bees of Gt. Brit., p. 143, 2nd ed., p. 134.

So far as my experience goes, this pretty little bee is very local and rare. Mr. Smith captured specimens at Budleigh in August.

GENUS, *CÆLIOXYE*, Latreille.

QUADRIDENTATA, Linn.

Ent. Ann., 1870, p. 27; *Smith*, Bees of Gt. Brit., p. 146, 2nd ed. p. 141.

Captured in North Devon, but very rare.

KLONGATA, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 224, t. 16, figs. 7, 8; *Smith*, Bees of Gt. Brit., p. 147, 2nd ed., p. 142.

A widely distributed insect, appearing in July and August. Mr. Smith captured it on High Peak, Sidmouth; I have taken it at Topsham, Fordlands, &c.

UMBRINA, *Smith*.

Bees of Gt. Brit., p. 148, 2nd ed., p. 144.

This was captured on High Peak by Mr. Smith in August, and I have taken it sparingly at Fordlands in July.

RUFESCENS, *St. Farg.*

Smith, Bees of Gt. Brit., p. 149, 2nd ed., p. 145.

This species has fallen to the net of Mr. Smith, who took it at Budleigh in August, 1872, and also in North Devon.

VECTIS, *Curtis*.

Brit. Ent., vol. viii., pl. 349; *Smith*, Bees of Gt. Brit., 2nd ed., p. 146.

This beautiful species has been taken at Morthoe, North Devon, in August.

GENUS, *STELIS*, Panzer.ATERRIMA, *Panz.*

Kirby, Mon. Apum Ang., vol. ii., p. 231, t. 16, fig. 9; *Smith*, Bees of Gt. Brit., p. 161, 2nd ed., p. 138.

A very rare insect with us. I captured a specimen many years ago, and have not seen one since. Mr. Smith has been more fortunate; he has taken several on High Peak, and also one or two in North Devon, in August.

PHÆOPTERA, *Kirby*.

Mon. Apum Ang., vol. ii., p. 232, No. 40; *Smith*, Bees of Gt. Brit., 2nd ed., p. 139.

A scarce insect. This was secured by Mr. Smith on High

Peak, Sidmouth, in August; and I have taken it near Exeter. It is parasitic on *Osmia fulviventris*. It is to be found in July and August.

OCTOMACULATA, *Smith*.

Bees of Gt. Brit., p. 153, 2nd ed., p. 140.

This must be regarded as a scarce species. Three specimens only have fallen to my lot, one of which was taken in June in the Exeter district, and the other two were captured near the Old Abbey. Mr. Smith met with it on Salcombe Hill in August.

GENUS, *MELECTA*, Latreille.

LUCTUOSA, *Scop.*

Smith, Bees of Gt. Brit., p. 155, 2nd ed., p. 136; *Newman*, Ent. Mag., vol. ii, p. 514.

This beautiful bee is not uncommon round Exeter in fine bright seasons. It makes its nests in cob-walls, and works very hard to excavate holes in the hard dry clay of which these walls are composed. I have taken specimens as early as 24th May. In an old wall which fell down during the incessant wet season 1878-9 there was the largest colony I have seen of this bee, and, curiously enough I could never discover the *Anthophora*, on which it is said to be parasitic in this country. Not seeing the host, I had great doubts whether this species is always parasitic, or whether it has not occasionally a colony of its own.

ARMATA, *Panz.*

Kirby, Mon. Apum Ang., vol. ii, p. 219, No. 35; *Smith*, Bees of Gt. Brit., p. 156, 2nd ed., p. 137.

This fine insect is not so common as the above, and is found more about dry hedgebanks, so far as I have observed its habits. It appears in May and June. It is taken in the Plymouth district.

Sub-Family, DASYGASTRÆ, Latreille.

GENUS, *OSMIA*, Latreille.

RUFÆ, *Linn.*

Kirby, Apum Ang., vol. ii., p. 271, No. 57; *Smith*, Bees of Gt. Brit., p. 162, 2nd ed., p. 152.

Very common, though none the less beautiful species when it first emerges from its cocoon; but it soon fades on exposure to the sun for only a few hours. This bee is a great lover of the sun, and may be seen sitting on a leaf basking in his rays.

- Var. B.*—This variety is a female, and differs in no respect from the type, except that the horns on the face are bifurcated. Taken near Exeter.

AURULENTA, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 269, No. 56; *Smith*, Bees of Gt. Brit., p. 163, 2nd ed., p. 159.

Mr. Smith has taken this on High Peak, Sidmouth, and I captured it at Torquay in July, 1863. It is, however, a scarce species. Mr. Bignell takes it at Plymouth.

XANTHOMELANA, Kirby.

Mon. Apum Ang., vol. ii., p. 246, No. 46; *Smith*, Bees of Gt. Brit., p. 165, 2nd ed., p. 155.

In June, 1856, I first took this fine species at Fordlands, near Ide. I captured both males and females on the flowers of *Hippocrepis comosa*. The bees were abundant this year, and a collector here captured great numbers of them, and sold them to someone in London. I visited the same place this year (1880), but not one was to be seen.

FULVIVENTRIS, Panz.

Kirby, Mon. Apum Ang., vol. ii., p. 263, No. 54; *Smith*, Bees of Gt. Brit., p. 163, 2nd ed., p. 154.

This is a widely-distributed species in both North and South Devon. It frequents the flowers of thistles in preference to anything else. Taken in July and August. It may also be seen flying round old posts, in which it makes its nest.

SPINULOSA, Kirby.

Mon. Apum Ang., vol. ii., p. 261, No. 53; *Smith*, Bees of Gt. Brit., p. 169, 2nd ed., p. 162.

Mr. Smith captured this little inconspicuous species on High Peak, Sidmouth, in August, 1872.

ÆNEA, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 264, No. 55; *Smith*, Bees of Gt. Brit., p. 170, 2nd ed., p. 153.

This is another wood-boring species, and may frequently be found busily at work in June and July forming burrows for their nests. The males and the females might easily be mistaken for distinct species, the former being brassy-green, and the latter a deep steel-blue.

LEUCOMELANA, *Kirby*.

Mon. Apum Ang., vol. ii., p. 260, No. 52; *Smith*, Bees of Gt. Brit., p. 171, 2nd ed., p. 161.

A rare and beautiful little species. I have taken it at Fordlands, June 18th, and in July it is generally found basking in the sun on the leaves of plants.

GENUS, *MEGACHILE*, *Latreille*.CENTUNCULARIS, *Linn*.

Kirby, Mon. Apum Ang., vol. ii., p. 237, No. 42; *Smith*, Bees of Gt. Brit., p. 174, 2nd ed., p. 172.

A very widely distributed species, appearing in July and August in all parts of the country; at the same time it cannot be called an abundant insect. This is one of the upholsterer bees. It is exceedingly interesting to watch them cutting out semicircular pieces of rose leaves, with which they line their cells. They sometimes make their nest in an old post, and sometimes in a dry bank; but they always hang their dwelling with green or coloured leaves.

VERSICOLOR, *Smith*.

Bees of Gt. Brit., p. 177, 2nd ed. p. 174.

An exceedingly rare species. I have one specimen I captured at Fordlands on July 17th, 1857, which is the only one I have seen. It is a female; the male up to the present time is not known.

ODONTURA, *Smith*.

Bees of Gt. Brit., p. 178, 2nd ed. p. 175.

The only specimen known of this species is in the British Museum. It was captured by Dr. Leach, or, to use his own note, "June: found sitting on a foot-path near our house," at Spitchwick, near Ashburton.

ARGENTATA, *Fabr*.

Curtis, Brit. Ent., vol. iv., p. 219 (*M. Leachella*); *Smith*, Bees of Gt. Brit., p. 179, 2nd ed., p. 176.

In July and August, 1856, this little bee was rather plentiful on the sandhills at Exmouth. Mr. Cooke, of New Oxford Street, London, was down here collecting at this time, and he showed me numbers of specimens he had taken, and I captured some myself. I have not met with it anywhere else.

CIRCUMCINCTA, Kirby.

Mon. Apum Ang., vol. ii., p. 246, t. 16, f. 10; *Smith, Bees of Gt. Brit.*, p. 180.

This rather local insect is taken in the Plymouth district by Mr. Bignell. I have never met with it in any of my entomological rambles in the county.

WILLUGHBIELLA, Kirby.

Mon. Apum Ang., vol. ii., p. 233, No. 41; *Smith, Bees of Gt. Brit.*, 2nd ed., p. 178.

This fine insect is very generally distributed. In July and August it may be taken occasionally boring into old posts, and it should especially be looked for among old willows, as it has a great partiality for the half-decayed stumps of this tree in which to make its nest.

MARITIMA, Kirby.

Mon. Apum Ang., vol. ii., p. 242, No. 43; *Smith, Bees of Gt. Brit.*, p. 182, 2nd ed., p. 179.

Not uncommon. Some seasons at Exmouth, Budleigh, and many places along the south coast in July and August.

GENUS, ANTHIDIUM, Fabricius.**MANICATUM, Linn.**

Kirby, Mon. Apum Ang., vol. ii., p. 248, t. 16, figs. 12, 13; *Smith, Bees of Gt. Brit.*, p. 185, 2nd ed., p. 168.

I have two males with the face, instead of being pale yellow, a rich honey, or rather a ferruginous yellow, one with scarcely any sign of a black macula on the clypeus. The other specimen has large yellow quadrate macula on five of the segments, the fifth having also two lunate markings of the same colour, the horns of the lunæ pointing towards the sides; the sixth segment has two yellow hook-shaped markings.

GENUS, CHELOSTOMA, Latreille.**FLORISOMNE, Linn.**

Kirby, Mon. Apum Ang., vol. ii., p. 253, No. 49; *Smith, Bees of Gt. Brit.*, p. 189, 2nd ed., p. 165.

This little bee is abundant some seasons, and widely distributed. Some years ago a large colony established itself in the thatch of an outhouse at Parker's Well House, Exeter. The bees had taken possession of the straws, and made their nests in them. From the sectional sketch of a straw, and the description I have now

before me, I made at the time, the female first places a quantity of pollen in a straw, beginning at one of the nodes or knots, then an egg is deposited, and again more pollen, and another egg, and so on until the straw is filled. When I opened the straw in question, the eggs had become larvæ, and some of the larvæ pupæ; the latter were each enveloped in a thin semi-transparent shining skin-like envelope; between each pupa was still some pollen remaining. They had not consumed all, and there was, in some cases, a considerable space between the pupa and the next mass of pollen, so that more than sufficient had been collected by the parent for its progeny. The straw at this time was, so far as I could discover, hermetically sealed, with grains of sand and small stones strongly cemented together, which must have been removed before the bees enclosed could make their exit.

GENUS, *CERATINA*, Latreille.

CUCURBITINA, Rossi.

Smith, Bees of Gt. Brit., p. 195, 2nd ed., p. 181.

This is inserted on rather doubtful grounds. There is a specimen in the British Museum collection labelled by Dr. Leach; the number corresponds with an entry in his MS. Catalogue, thus: "June 4th, 236, taken in Tot-hill Lane." And so far as is known the species has not been seen since. Perhaps a search in the locality in a fine season might reward the collector.

CYNEA, *St. Farg.*

Kirby, Mon. Apum Ang., vol. ii., p. 308, pl. 17, figs. 7, 8; *Smith*, Bees of Gt. Brit., 2nd ed., p. 180.

This pretty little species was captured at Budleigh Salterton by Mr. Smith. It appears in June and July.

Sub-Family SCOPULIPEDES, Latreille.

GENUS, *EUCERA*, Scopoli.

LONGICORNIS, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 278, No. 59; *Smith*, Bees of Gt. Brit., p. 197, 2nd ed., p. 183.

This remarkable bee is generally distributed, and sometimes forms large colonies. A few years ago a very large colony established themselves on a raised or bank-like part of a gentleman's lawn in this neighbourhood, and when the colony was all astir it was quite a sight to be remembered.

GENUS, *SAROPODA*, Latreille.BIMACULATA, *Panz.*

Kirby, Mon. Apum Ang., vol. ii., p. 291, No. 66; *Smith*, Bees of Gt. Brit., p. 199, 2nd ed. p. 186.

Not common, but sparsely distributed over the southern part of the county; and it may be also in the north, but I have not seen any specimens from there. I have taken it at Exmouth in July and August.

GENUS, *ANTHOPHORA*, Latreille.ACERVORUM, *Fabr.*

Kirby, Mon. Apum Ang., vol. ii., p. 296, No. 69; *Smith*, Bees of Gt. Brit. p. 204, 2nd ed., p. 190.

I have taken great interest in this little bee since 1863; for since that time I have had a pair, or sometimes two pairs, bred I believe in the cob-wall of a coach-house which abuts on my garden; but whether they breed there or not they come into the garden, I believe from their freshness and the season of the year, directly they are freed from their cells. Curious enough, there generally is but a pair only, and the earliest I have noticed the male to appear is March 3rd, 1863; the temperature was then forty-two degrees in the shade. In 1869, the male appeared on March 5th; the temperature was fifty-four, and so on, varying the dates in the month of March for thirteen years, and only four times has this bee deferred his appearance until April in nineteen years. The females are generally a week later at least in putting in an appearance; thus in 1871 the male came out March 17th, the temperature at this time was forty-six. The female followed on the 24th, and in 1874 the male came out March 21st, and the female on the 1st of April, the temperature being fifty-seven.

QUADRIMACULATA, *St. Farg.*

Smith, Brit. Bees, p. 192; *Kirby*, Mon. Apum Ang., vol. ii., p. 295.

Taken at Exmouth.

FURCATA, *Panz.*

Kirby, Mon. Apum Ang., vol. ii., p. 288, No. 64, t. 17, figs. 5, 6; *Smith*, Bees of Gt. Brit., p. 206, 2nd ed., p. 193.

This bee is not abundant, but is distributed over the entire county. The earliest time I have taken it is July 5th.

Sub-family, SOCIALES, Latreille.

Genus, BOMBUS, Latreille.

MUSCORUN, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 326, No. 81; Smith, Bees of Gt. Brit., p. 212, 2nd ed., p. 199.

Common everywhere during the latter part of summer.

Var. A.—I took six specimens of this variety, all females, on the grassplot at Druid, Ashburton, July, 1876. They are all marked alike, and would appear to be all of one brood. One would infer from this that this is a permanent variety.

Var. B.—Not common.

Var. G.—This variety has the abdomen covered with a dense bright fulvous pubescence, with the sides alone black. I have one specimen only.

Var. A.—Worker; not very common, I have a variety I showed to Mr. Smith some years ago, the pubescence on the head and thorax is griseous yellow; the abdomen above is entirely destitute of hairs, except at the extreme apex, where are a few pale yellowish ones, otherwise it is perfectly smooth and shining beneath, with a few griseous hairs. I never saw but this one; I believe I captured it on Haldon.

Var. minor.—I have two specimens, presented to me by Mr. Smith, who regarded them as a distinct variety, and I have captured three specimens myself.

VENUSTUS, Smith.

Kirby, Mon. Apum Ang., vol. ii., p. 317, No. 74; Donovan, Brit. Insects, vol. xi., t. 382, f. 2; Smith, Bees of Gt. Brit., p. 214, 2nd ed., p. 201.

This bee is especially attached to the flowers of the wood sage, and is to be found all over the county.

SYLVARUM, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 236, No. 82, t. 17, figs. 15, 16; Smith, Bees of Gt. Brit., p. 217, 2nd ed., p. 203

A widely dispersed, and one of the handsomest of our native insects, and, as Mr. Smith well remarks, it is one of the most constant in its colouring. The trivial name would lead one to believe it was found in woods; this, however, is not my experience, but it is found more especially on high ground on the margin of woods.

DERHAMELLUS, Kirby.

Mon. Apum Ang., vol. ii., p. 363, No. 106; *Smith*, Bees of Gt. Brit., p. 219, 2nd ed., p. 206.

Mr. Smith captured this fine insect in North Devon, and Mr. Bignell has taken it in the Plymouth district.

PRATORUM, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 356, No. 99. p. 357, No. 100, t. 18, f. 6; *Smith*, Bees of Gt. Brit., p. 220, 2nd ed., p. 207.

Generally distributed; and common in July to the end of summer.

Var. B.—With the black band covering the third and fourth segments. I have one specimen only.

Var. G.—Male, with the four basal segments of the abdomen black, or with a few yellow hairs mixed with the black. Apparently rare.

JONELLUS, Kirby.

Mon. Apum Ang., vol. ii., p. 333, No. 90; *Smith*, Bees of Gt. Brit., p. 222, 2nd ed., p. 209.

So far as my experience goes, this is a rare species with us. The only place I have taken it is on Prawle Point, on the wild thyme, July, 1876. Mr. Smith has taken it in North Devon, and Mr. Bignell at Plymouth.

LAPIDARIUS, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 363, No. 106; *Smith*, Bees of Gt. Brit., p. 228, 2nd ed., p. 211.

This beautiful bee is generally distributed over the county.

HORTORUM, Linn.

Smith, Bees of Gt. Brit., p. 230.

To be met with everywhere. Mr. Smith remarks, that he had not observed any varieties in the sexes of this species; and so far as I have seen, it is most permanently marked.

LATREILLELLUS, Kirby.

Mon. Apum Ang., vol. ii., p. 330, Nos. 84-95; *Smith*, Bees of Gt. Brit., p. 231.

This very beautiful species is taken by Mr. Bignell in the Plymouth district; but up to the present I have not seen the insect in the county.

SUBTERRANEUS, *Linn.*

Kirby, Mon. Apum Ang., vol. ii., p. 364-373, Nos. 98-110; *Smith*, Bees of Gt. Brit., p. 232.

Common everywhere, and a most variable species. I have the following varieties:

Var. B.—Female; the collar, scutellum, and sides of the basal segment of the abdomen, bright fulvous yellow; the apex of the abdomen dusky white.

Var. G.—The lateral margins of the scutellum faintly tinged with yellow, and the fourth segment of the abdomen obscurely fuscous, with a faint yellow tinge.

Var. D.—Entirely black, except the apex of the abdomen, which is obscurely fuscous.

Var. E.—Entirely black.

LUCORUM, *Linn.*

Kirby, Mon. Apum Ang., vol. ii., p. 349, No. 95; *Smith*, Bees of Gt. Brit., p. 226.

A generally-distributed species all over the county.

VIRGINALIS, *Kirby*.

Mon. Apum Ang., vol. ii., p. 350; *Smith*, Brit. Bees, 2nd ed., p. 214.

This fine insect is common in all parts of the county. It may be said to be the most abundant of all the British bombi or humble bees.

GENUS, *APATEUS*, *Newman*.RUPESTRIS, *Fabr.*

Kirby, Mon. Apum Ang., vol. ii., p. 361-369, Nos. 104-108; *Smith*, Bees of Gt. Brit., p. 234, 2nd ed., p. 221.

Rather common, and generally distributed over the county, appearing rather late in August and September.

CAMPESTRIS, *Panz.*

Kirby, Mon. Apum Ang., vol. ii., p. 335, Nos. 85, 87, 88, t. 18, figs. 1, 2; *Smith*, Bees of Gt. Brit., p. 235, 2nd ed., p. 223.

Generally distributed and common, and liable to great variety in the colouration.

Var. B.—Male. This specimen differs from that described by Mr. Smith in *Bees of Great Britain*, in having the sides of the thorax slightly yellow; and the third and three following segments of the abdomen have a dusky-yellow pubescence.

Var. G.—Male. The pubescence entirely black, except the third and following segments have a dusky-yellow pubescence.

Var. D.—Male. The pubescence entirely black, except the apical segments, which are fuscous-yellow.

Var. E.—Male. The thorax in front, the scutellum and basal segment of the abdomen, the third and following segments, clothed with yellow pubescence; the extreme apex black.

BARBUTELLUS, Kirby.

Mon. Apum Ang., vol. ii., p. 343, No. 93, t. 18, f. 4; *Smith, Bees of Gt. Brit.*, p. 237.

A general though not very abundant species in all parts of the county; more frequent perhaps on Dartmoor than either of the others.

VESTALIS, Fourc.

Kirby, Mon. Apum Ang., vol. ii., p. 347, No. 95, t. 18, f. 3, *Smith, Bees of Gt. Brit.*, p. 238, 2nd ed. p. 221.

A generally distributed insect, and commonly met with on thistle-heads, and such composite flowers, in autumn.

I took a fine female of this at Ide, on May 12th, 1880. This did not appear to have been an hibernated specimen, its colours were so fresh; and I believe this was one of an early brood. Mr. Shuckard believed this genus to be double-brooded, but Mr. Smith thinks not; it is therefore somewhat of an open question.

GENUS, APIS, Linnaeus.

MELLIFICA, Linn.

Kirby, Mon. Apum Ang., vol. ii., p. 312, No. 73, t. 17, figs. 10-12; *Smith, Bees of Gt. Brit.*, p. 241, 2nd ed., p. 226.

This can scarcely be called indigenous to this country, but has become somewhat naturalised; though in some seasons, such as that of 1879, the weather has been so wet and gloomy that the poor bees have not been able to collect sufficient food to carry them through the winter. Last year (1879), so early as November, I received a letter from a bee-keeper, who said that nearly all his bees were then dead from want of their natural food. And if this be the case so early in the winter, we know what must be the result before the following March. The poor bees must therefore die of starvation, whether they are living under domestication or in a wild state, in such seasons as that of last year.

LIGUSTICA.

This pretty bee was, I believe, introduced into this country by an indefatigable apiarian, the late Mr. Woodbury, who took great pains also to introduce other species of social and honey-storing bees. *Ligustica* was found after considerable trial to be so pugnacious to persons coming or passing near them, that Mr. Woodbury had to have woodwork placed on his garden wall to make the bees fly higher, that they might not be brought into contact with passers-by. This bee being larger, and considered stronger than *A. mellifica*, it was considered an advantage to have it, but its irritable temper and pugnacious habits have not proved advantageous over its old rival, which with care may be able to hold its own.

Mr. Smith enumerated this bee as found on Peak Hill, Sidmouth.

FASCIATA.

This very handsome bee was introduced by Mr. Woodbury from India, where it forms its nest in the hollows, and, as I am informed, on the branches of trees. Although great care was taken of it when it arrived, the introducer told me that he thought it was not sufficiently strong to stand our climate.

LUNDY ISLAND.

I am indebted for the following list of Hymenoptera to the indefatigable exertions of my late friend, Mr. Frederick Smith, of the Zoological Department of the British Museum. The island is not rich in this order of insects, but quite as rich perhaps as one might expect from the nature of its soil; for these insects, as a rule, prefer a dry, warm sandy soil to that of any other.

Formica fusca	Sphecodes rufescens
— nigra	— subquadratus
— flava	Halictus rubicundus
Myrmica ruginodis. This is very	— cylindricus
common	— flavipes
Pompilus gibbus	— morio
Odynerus gracilis	— minutus
— trimarginatus	Andrena pubescens
Vespa vulgaris	Nomada Jacobæa
— sylvestris	Bombus lucorum
Colletes succincta	— hortorum
Sphecodes gibbus	Apathus vestalis

THE MYTH OF BRUTUS THE TROJAN.

BY R. N. WORTH, F.G.S., ETC.

(Read at Totnes, July, 1880.)

BRUTUS, son of Sylvius, grandson of Æneas the Trojan, killed his father while hunting ; was expelled from Italy, and settled in Greece. Here the scattered Trojans, to the number of 7000, besides women and children, placed themselves under his command, and, led by him, defeated the Grecian King Pandrasus. The terms of peace were hard. Pandrasus gave Brutus his daughter Ignoge to wife, and provided 324 ships, laden with all kinds of provisions, in which the Trojan host sailed away to seek their fortune. An oracle of Diana directed them to an island in the Western Sea, beyond Gaul, "by giants once possessed." Voyaging amidst perils, upon the shores of the Tyrrhenian Sea they found four nations of Trojan descent, under the rule of Corinæus, who afterwards became the Cornish folk. Uniting their forces the Trojans sailed to the Loire, where they defeated the Gauls and ravaged Aquitaine with fire and sword. Then Brutus "repaired to the fleet, and loading it with the riches and spoils he had taken, set sail with a fair wind towards the promised island, and arrived on the coast of Totnes. This island was then called Albion, and was inhabited by none but a few giants. Notwithstanding this, the pleasant situation of the places, the plenty of rivers abounding with fish, and the engaging prospect of its woods, made Brutus and his company very desirous to fix their habitation in it. They therefore passed through all the provinces, forced the giants to fly into the caves of the mountains, and divided the country among them, according to the directions of their commander. After this they began to till the ground and build houses, so that in a little time the country looked like a place that had been long inhabited. At last Brutus called the island after his own

name, Britain, and his companions Britains; for by these means he desired to perpetuate the memory of his name. From whence afterwards the language of the nation, which at first bore the name of Trojan, or rough Greek, was called British. But Corinæus, in imitation of his leader, called that part of the island which fell to his share, Corina, and his people Corineans, after his name; and though he had his choice of the provinces before all the rest, yet he preferred this county, which is now called in Latin Cornubia, either from its being in the shape of a horn (in Latin Cornu), or from the corruption of the same name. For it was a diversion to him to encounter the said giants, which were in greater numbers there than in all the other provinces that fell to the share of his companions. Among the rest was one detestable monster called Goemagot, in stature twelve cubits, and of such prodigious strength that at one stroke he pulled up an oak as if it had been a hazel wand. On a certain day, when Brutus was holding a solemn festival to the gods, in the port where they at first landed, this giant, with twenty more of his companions, came in upon the Britons, among whom he made a dreadful slaughter. But the Britons, at last assembling together in a body, put them to the rout, and killed them every one except Goemagot. Brutus had given orders to have him preserved alive out of a desire to see a combat between him and Corinæus, who took a great pleasure in such encounters. Corinæus, overjoyed at this, prepared himself, and, throwing aside his arms, challenged him to wrestle with him. At the beginning of the encounter Corinæus and the giant, standing front to front, held each other strongly in their arms, and panted aloud for breath; but Goemagot, presently grasping Corinæus with all his might, broke three of his ribs, two on his right side and one on his left. At which Corinæus, highly enraged, roused up his whole strength, and snatching him upon his shoulder ran with him, as fast as the weight would allow him, to the next shore, and there getting upon the top of a high rock hurled down the savage monster into the sea, where falling on the sides of craggy rocks he was torn to pieces, and coloured the waves with his blood. The place where he fell, taking its name from the giant's fall, is called Lam Goemagot, that is, Goemagot's Leap, to this day."*

Such, in its complete form, is the Myth of Brutus the Trojan, as told by Geoffrey of Monmouth, sometime Bishop of St. Asaph, who professed, and probably with truth, to

* GEOFFREY OF MONMOUTH, *Giles's Translation*.

translate the British History of which it forms a part, from "a very ancient book in the British tongue," given to him by Walter Mapes, by whom it had been brought from Brittany. Geoffrey wrote in the earlier part of the twelfth century, and he does not indicate with more precision than the use of the term "very ancient" the date of his original.

If, however, we are to accept the writings of Nennius as they have been handed down, as substantially of the date assigned to them by the author—the middle of the ninth century, the legend of Brutus, though not in the full dimensions of the Geoffreian myth, was current at least a thousand years ago; and in two forms. In one account Nennius states that our island derives its name from Brutus, a Roman consul, grandson of Æneas, who shot his father with an arrow, and, being expelled from Italy, after sundry wanderings settled in Britain—a statement that agrees fairly well with that of Geoffrey. In the other account, which Nennius says he had learned from the ancient books of his ancestors, Brutus, though still through Rhea Silvia, his great grandmother, of Trojan descent, was grandson of Alanus, the first man who dwelt in Europe, twelfth in descent from Japhet in his Trojan genealogy, and twentieth on the side of his great grandfather, Fethuir. Alanus is a kind of European Noah, with three sons, Hisicion, Armenon, and Neugio; and all his grandsons are reputed to have founded nations—Francus, Romanus, Alamanus, Brutus, Gothus, Valagothus, Cibidus, Burgundus, Longobardus, Vandalus, Saxo, Boganus. He is wholly mythical.

Brutus here does not stand alone. He falls into place as part of a patriarchial tradition, assigning to each of the leading peoples of Europe an ancestor who had left them the heritage of his name. This one fact, to my mind, removes all suspicion of the genuineness of these passages of Nennius, which have been sometimes regarded as interpolations. With Geoffrey not only is the story greatly amplified, but it is detached from its relations, and is no longer part of what may fairly be called one organic whole. Nennius, therefore, gives us an earlier form of the myth than Geoffrey. I think, too, that the essential distinctions of the two accounts render it clear that the ancient authorities of Nennius and Geoffrey are not identical, from which we may infer that the original tradition is of far older date than either of these early recorders.

But we may go still further. Whether the legend of Brutus is still extant in an Armorican form I am not aware,

but it appears in Welsh MSS. of an early date; the "Brut Tysilio," and the "Brut Gr. ab Arthur," being the most important. It has been questioned whether, in effect, these are not translations of Geoffrey; but there seems no more reason for assuming this than for disbelieving the direct statement of Geoffrey himself that he obtained his materials from a Breton source. Bretons, Welsh, and Cornish, are not only kindred in blood and tongue, but, up to the time when the continuity of their later national or tribal life was rudely shattered, had a common history and tradition, which became the general heritage. If the story of Brutus has any relation to the early career of the British folk we should expect to discover traces of the legend wherever the Britons found their way. If this suggestion be correct; if Geoffrey drew from Armoric sources, and if the "Brut Tysilio," which is generally regarded as the oldest of the Welsh chronicles, represents an independent stream, the myth must be dated back far beyond even Nennius; as the common property of the Western Britons, ere, in the early part of the seventh century, the successes of the Saxons hemmed one section into Wales, another into Cornwall, and drove a third portion into exile with their kindred in Armorica. There is consequently good reason to believe that the tradition is as old as any other portion of our earliest recorded history, or quasi-history, and covers, at least, the whole of our historical period.

The narrative of Geoffrey does not give the myth in quite its fullest shape. For that we have to turn to local sources. Tradition has long connected the landing of Brutus with the good town of Totnes; the combat between Corinæus and Goemagot with Plymouth Hoe. Like the bricks in the chimney called in to witness to the noble ancestry of Cade, has not Totnes its "Brutus stone"? and did not Plymouth have its "Goemagot"?

The whole history of the "Brutus stone" appears to be traditional, if not recent. My friend, Mr. Edward Windeatt, informs me that it is not mentioned anywhere in the records of the ancient borough of Totnes. I fail to find any trace of it in the pages of our local chroniclers, beyond the statement of Prince (*Worthies*) that "there is yet remaining towards the lower end of the town of Totnes, a certain rock called Brute's stone, which tradition here more pleasantly than positively says is that on which Brute first set his foot when he came ashore. The good people of Totnes, so it is said, have had it handed down to them by their fathers from a time beyond

the memory of man, that Brutus when he sailed up the Dart, which must consequently have been a river of notable pretensions, stepped ashore upon this stone, and exclaimed, with regal facility of evil rhyme—

“Here I stand, and here I rest,
And this place shall be called Totnes !”

Why the name should be appropriate to the circumstances we might vainly strive to guess, did not Westcote and Risdon inform us that it was intended to represent *Tout al aise* ! We need not be ashamed of adopting their incredulity, and of doubting with them whether Brutus spoke such good French, or indeed whether French was then spoken at all.

The stone itself affords no aid ; all mystery departed when it was recently lifted in the course of pavement repairs, and found to be a boulder of no great dimensions, with a very modern looking bone lying below. However, it is the “Brutus stone,” and I daresay will long be the object of a certain amount of popular faith.*

But according to Geoffrey of Monmouth himself, Totnes town could not have been intended by him as the scene of the landing of Brutus. It was when Brutus was “holding a solemn festival to the gods, in the port where they had at first landed,” that he and his followers were attacked by Goemagot and his party. There it was that Goemagot and Corinæus had that famous wrestling bout, which ended in Corinæus running with his gigantic foe to the next shore, and throwing him off a rock into the sea. There is no sea at Totnes, no tall craggy cliff ; and for Corinæus to have run with his burden from Totnes to the nearest point of Start or Tor Bay, would have been a feat worthy even of a Hercules.

We are not surprised to find, therefore, that Totnes has her rivals—Dover, set up by the Kentish folk, and Plymouth,† each claiming to be the scene of the combat between Corinæus

* I was unaware until the meeting of the Association, that an old inhabitant of Totnes named John Newland states that he and his father removed this stone from a well which they were digging about sixty years ago, and deposited it in its present position. The stone is precisely such a boulder as occurs in large numbers in the deposit left by the Dart on the further margin of the alluvial flat or “strath” at Totnes, and which is cut through by the tram-road to the quay, near the railway station. Popular opinion is in favour of the authenticity of the stone, but it can hardly have been the “rock” referred to by Prince, already cited, “towards the lower end of the town ;” and for my own part I am inclined to regard it as the “modern antique” Newland’s account would make it, to which the old tradition has been transferred. Moreover, there is yet current a local tradition that Brutus landed at Warland. If this is not held to dispose of the present “Brutus stone,” it certainly indicates an important divergence of authorities.

† Bridport also, on the ground of its etymology, Brute-port (!)

and Goemagot, and claiming therefore incidentally also to be the port in which Brutus landed. I do not know that we can trace either tradition very far into antiquity. They do not occur in the Chronicles, where indeed the very name of Plymouth is unknown. The earliest reference to that locality has been generally regarded as the Saxon Tamarworth. I am not at all sure, however, that Plymouth is not intended by Geoffrey's "Hamo's Port," which he assumes to be Southampton. Geoffrey indeed says that Southampton obtained the *ham* in its name from a crafty Roman named Hamo, killed there by Arviragus; but if the identification is no better than the etymology we may dismiss it altogether. On the other hand the name of the estuary of the Tamar is still the Hamoaze—a curious coincidence, if it goes no further. There is nothing in the story of Hamo itself to indicate Southampton or preclude Plymouth. Only a few references to Hamo's Port occur in Geoffrey. One of these, where Belinas is described as making a highway "over the breadth of the kingdom" from Menevia to Hamo's Port, may rather seem to point to Southampton; but there is no positive identification even if we assume the story to be true. Again, "Maximian the senator," when invited into Britain by Caradoc, Duke of Cornwall, to be king of Britain, lands at Hamo's Port; and here the inference would rather be that it was on Cornish territory. And so when Hoel sent 15,000 Armoricans to the help of Arthur, it was at Hamo's Port they landed. It was from Hamo's Port that Arthur is said to have set sail on his expedition against the Romans—a fabulous story indeed, but still helping to indicate the commodiousness and importance of the harbour intended. It was at Hamo's Port that Brian, nephew of Cadwalla, landed on his mission to kill the magician of Edwin the king, who dwelt at York, lest this magician might inform Edwin of Cadwalla's coming to the relief of the British. After he had killed Pellitus Brian called the Britons together at Exeter; and it would be fair to infer that the place where he landed was likely to be one where the Britons had some strength. Here again, whatever we may make of the history, it is Hamo's Port that is the fitting centre of some of the most stirring scenes in the traditional national life; and it is the Hamoaze that best suits the reference.

This legend of Brute the Trojan was firmly believed in, and associated with these Western shores, by the leading intellects of the Elizabethan day. Spencer refers to it in his *Faery Queene*.

"That well can witness yet unto this day
The Western Hough besprinkled with the Gore
Of mighty Goemot."

Drayton versifies the legend in his *Polyolbion*, and tells us how

"Upon that loftie place at *Plymmouth*, call'd the *Hoe*,
Those mightie Wrastlers met."

and how that Gogmagog was by Corin

"Pitcht head-long from the hill ; as when a man doth throw
An Axtree, that with sleight deliurd from the Foe
Rootes up the yeelding earth, so that his violent fall,
Strooke *Neptune* with such strength, as shouldred him withall ;
That where the monstrous waues like Mountaines late did stand,
They lea'pt out of the place, and left the bared sand
To gaze vpon wide heauen."

And this article of faith had then long been popular. Carew, in his *Survey of Cornwall*, says: "Moreover vpon the Hawe at *Plymmouth*, there is cut out in the ground the pourtrayture of two men, the one bigger, the one lesser, with clubbes in their hands (whom they terme Gogmagog), and (as I have learned) it is renewed by order of the Townesmen when cause requireth, which should inferre the same to be a monument of some moment." Westcote, writing some half a century later, states of the Hoe, "in the side whereof is cut the portraiture of two men of the largest volume, yet the one surpassing the other every way; these they name to be Corinæus and Gogmagog."

And there these figures remained until the Citadel was built in 1671; a remarkable witness of the local belief that Plymouth had played a prominent part in the affairs of Brutus and his fellows.

We know when these figures ceased to be. Can we form any idea as to when they originated? Their earliest extant mention occurs in the Receiver's Accounts of the borough of Plymouth under date 1494-5.

"It paid to Cotewyll for y^e renewyng of y^e pyctur of Gogmagog a pon y^e howe. vij^d."

Previous to this date there only remain complete accounts of two years, those for 1493-4, and those for 1486, with a few fragmentary entries; and as the Gogmagog did not come to be "renewed" every year, there are no conclusions to be drawn from the absence of earlier notices. The next entry is in 1500-1 when 8d. was paid for "makyng clene of gogmagog." In 1514-15 John Lucas, sergeant, had the like sum for "cuttyng of Gogmagog;" and in the following year we read

of its "new dyggyng." In 1526-7 the entry runs: "Itm p^d for Clensyng & ryddyng of gogmagog a pon ye howe viij^d;" and about this time it was renewed almost yearly. In 1541-2 the entry is, "Itm p^d to William hawkyngs baker [evidently to distinguish him from William Hawkyngs, father of Sir John] for cuttyng of Gogmagog the pycture of the Gyaunt at hawe viij." In 1566-7 the price had gone up to twenty-pence. Probably this ancient monument had been neglected for some years before the last vestiges disappeared in 1671. It is not likely to have been renewed under the Commonwealth, nor do I think it was revived under the Restoration. It is noteworthy that the official entries apparently refer to one figure only, though we know from Carew and Westcote that there were two. Fourpence a day was about an average wage for labourers at Plymouth in the opening years of the sixteenth century, so that the "pyctur" probably took about two days to cleanse, and therefore must indeed have been of gigantic dimensions.

Some years ago I threw out the suggestion that, as Geoffrey made no allusion to these figures, "it must be assumed either that he did not know of their existence, or that they did not then exist." Believing the latter the more reasonable conclusion I suggested further, "that they were first cut in the latter half of the twelfth century, soon after Geoffrey's chronicle became current, or not long subsequently; unless, as is possible, they had a different origin, and were associated with the wrestling story in later days." Finally I put forward the hypothesis, "that the legend in the first place did refer to something that occurred in the fifth century at or near the Hoe, and with which the Armorican allies, whom Ambrosius called to his aid about the year 438, were associated; that the Armoricans, on their return to Brittany, carried the story with them; that in Brittany, between the fifth and twelfth centuries, under the mingled influence of half-understood classical history, and of religious sentiment working through the romantic mind, it developed into the full-blown myth of Brutus the Trojan; and that when it returned to England, and was made known under the auspices of Geoffrey of Monmouth, the Plymouthians of that day, to perpetuate the memory of what they undoubtedly believed to be sterling fact, cut the figures of the two champions on the greensward of the Hoe."

I am not inclined now to adopt this hypothesis so broadly as it was then suggested. Probably the story did take shape in Brittany in some such fashion, but I now believe we must

look far beyond the fifth century for its origin. There seems, however, little reason to doubt that the "Brutus stone" of Totnes, and the Gogmagog of Plymouth, originated, like the Gog and Magog of London city, in the popularity of Geoffrey's book. The name, of course, linked Totnes with the legend, but we have absolutely no knowledge whatever of the reason why Plymouth (any more than Dover) came into the story. Dover, indeed, has no case whatever; not even a "Gogmagog."

What, then, are the claims of Totnes?

Now as to Totnes it is important, in the first place, to observe that in all the early works, Totnes is generally alluded to as the name of a district and not of a town. For example, in the story of Brutus, as given by Geoffrey of Monmouth, his hero "set sail with a fair wind towards the promised island, and arrived on the *coast* of Totnes." Nennius does not mention any place of debarkation. Geoffrey makes Vespasian arrive at the *shore* of Totnes, and, in quoting Merlin's prophecy to Vortigern concerning his own fate, says of the threatened invasion of Aurelius Ambrosius, and Uther Pendragon, "to-morrow they will be on the *shore* of Totnes." Later in the same chronicle, the Saxons whom Arthur had allowed to depart, "tacked about again towards Britain, and went on shore at Totnes." Though the town seems rather to be indicated here, it is not necessarily so. However it is certain that we are to understand the landing to have taken place somewhere upon the south coast, for the invaders made an "utter devastation of the country as far as the Severn sea." Constantine is said to have landed at the *port* of Totnes, which again may mean a place so called, or the principal harbour of a district of that name. It is clear, then, all things considered, that we are not dealing in these older chronicles with the present Totnes—great as is its antiquity—though the "Brut Tysilio" does go so far as to specify the place of Constantine's landing as "Totnais in Loegria."*

Now Mr. T. Kerslake, of Bristol, who has applied himself with singular acumen to the unravelling of sundry knotty points of our ancient history, is inclined to hold that the Totnes of the Chronicles was a distinct place; and he has pointed out that the Welch Chronicles contain "early forms of the names of this favourite British port that has got to be thus confounded with Totnes." In the "Brut Tysilio," for example, the place of the landing of Brutus is called "Talnas"

* *A Primæval British Metropolis*, p. 48.

(at least this is the printed form given in the *Myvyvian Archæology*); "Brut Gr. ab. Arthur" reads "Totony's;" and in a third, the "Hafod Chronicle," we have "Twtnais." Mr. Kerslake, therefore, treats Talnas as the earliest form of the word, and thereon builds the hypothesis that "the name given by the British writers to their port would resolve itself into 't-Aln-as'; and if Christchurch Haven should be conceded to be Ptolemy's estuary of Alaunus, it would also be the port called by the Britons 'Aln' or 't-Aln-as,' from which Vespasian advanced up to Alauna Sylva, or *Caer Pensauelcoit*—the City in the Head of the High Wood."*

There can be little doubt, I think, that Mr. Kerslake is right in regarding Penselwood as the site of *Caer Pensauelcoit*, given as Exeter by Geoffrey of Monmouth, not apparently on the authority of his British original, but, as in other cases, for his own gloss; and thenceforward cherished most fondly as one of the worthiest memories of the "ever faithful" city by its chief men and antiquaries. If it was at Totnes town, or in Torbay, into which some critics have expanded the idea of the "*Totonesium littus*," that Vespasian landed immediately before his siege of "Kairpen-Huelgoit," then there is considerable force in Geoffrey's comment, "*quæ Exonia vocatur*." If Penselwood, on the borders of Somerset, Dorset, and Wilts, were this "*Primæval British Metropolis*," then we must give up the idea that Vespasian landed at Totnes town, or anywhere in its vicinity. However, it by no means follows that there was such a place as Totnes in the Talnas sense, as localised by Mr. Kerslake. Talnas is the single exception, so far as I am aware, to an otherwise general concord of agreement in favour of Totnes, at a date when Totnes town had not yet risen into such prominence as to justify or explain its appropriation of this tradition. The general sense of the language used when Totnes and the Totnes shore are mentioned lead me, as I have already said, to the conclusion that it was rather the name of a district than of a town or port; and it was evidently understood in this sense by Higden, who in his *Chronicle* quotes the length of Britain as 800 miles, "*a totonesio litore*," rendered by Trevisa, "*frome the clyf of Totonesse*," which I take to be only another form of expression for the Land's End.

My suggestion is that what we may call the Older Totnes is really the ancient name for the south-western promontory of England, and perhaps may once have been a name for Britain itself, in which case we can understand somewhat of

* *A Primæval British Metropolis*, p. 97.

the motive which led early etymologists to derive Britain from Brute or Brutus. The myth may be so far true that an elder name was supplanted by that which has survived, and that it lingered latest in this western promontory, perhaps as a name for the district occupied by the Kornu-British kingdom in its more extended form. Whether the modern Totnes is nominally the successor of the ancient title, the narrow area into which this vestige of far antiquity has shrunk may be doubtful; for the name is as capable of Teutonic derivation as of Keltic. In my "Notes on the Historical Connections of Devonshire Place-names," I pointed out that a Saxon derivation that "would fit Totnes town quite as well as any other would be from *Tot*, an 'enclosure, and *ey* an 'island'—Totaneys—allied to Tottenham, and associated with the island by the bridge, one of the Dart's most notable features."* For the original Totnes I suggested "Perhaps instead of *ness*, a 'headland' [Scandinavian], we should read *enys*, an 'island'; and *Tot* may be equivalent to the *Dod* or *Dodi*, which we have in the Dod of the well-known Cornish headland, the Dodman. . . . Then we may read Totenys the 'projecting or prominent island'; or, if *Dod* is read as rocky, the 'rocky island.'" I am satisfied that it is somewhere in this direction we have to look for the origin of the name, which would seem however to be corrupted from its earliest form when we first light upon it, and which may indeed be a relic of the giant race whom the followers of Brutus extirpated.

The last sentence may sound somewhat strangely, but my inquiries into this curious story have led me to attach more importance to it than at first sight it seemed to deserve. Stripped of the dress in which it was decked out by Geoffrey, improving on his predecessors; deprived of its false lustre of classicism; cleared from the religious associations of a later day—the myth of Brutus the Trojan loses its personality, but becomes the traditionary record of the earliest invasion of this land by an historic people, who, in their assumed superiority dubbed the less cultivated possessors of the soil whose rights they invaded, "giants," and extirpated them as speedily as they knew how.

Moreover though Totnes town has to surrender its mythical hero, it preserves a record of an elder name for this England of ours than either the Britain of the later Kelts or the Albion of the Romans; and, if that name be indeed a survival from these early times, makes certain what the general aspect of the story renders highly probable—

* *Trans. Dev. Assoc.*, vol. x. pp. 299-300.

that it was into this corner of Britain the pre-Keltic or Iberic inhabitants of our island first entered, and that it was here their rude predecessors—who to the diminutive Turanians might indeed appear as “giants”—made their final stand—just as in later days the non-Aryan invaders had to fly before the Kelt, and the Kelt in turn before the Saxon, until the corners of the island became the refuge not only of a gallant, but of a mingled race, with one language, one faith, and a common tradition.

Thus much indeed I think we may safely infer from the local associations of the story, supported as that inference is by the yet current traditions of the giant enemies of the Cornish folk.

NOTES ON
THE EARLY HISTORY OF DARTMOUTH,
WITH ESPECIAL REFERENCE TO ITS COMMERCE, SHIPPING,
AND SEAMEN IN THE FOURTEENTH CENTURY.

BY PAUL Q. KARKEEK.

(Read at Totnes, July, 1880.)

PROBABLY few places are more intimately associated with the early history of English commerce and shipping than the now comparatively insignificant town of Dartmouth. This can easily be explained by considering how much its natural advantages would weigh in its favour when marine architecture, marine warfare, and nautical matters generally, were in a less advanced stage of development than they are to-day. The entrance to the harbour is very narrow, so that but slight defence on either side, would serve to keep out an enemy unprovided with armour-plate and heavy artillery. The high hills on each side rendered the harbour a very safe anchorage in the roughest of weather; and the great depth of water enables even the large vessels of to-day to enter at all stages of the tide. These advantages seem to have been overlooked of late years, and other ports have arisen which have attracted to them the trade of the times; and now there remains but little of the former mercantile splendour of the once important town of Dartmouth.

If legends are to be relied on, Totnes is the older town; and this is probably the truth. But when men began to build vessels requiring a greater depth of water than could be had at Totnes at low tide, then the villages at the mouth of the river began to rise in importance and gradually extend their borders. This has been the case with several of the seaports situated on tidal rivers, Truro and Falmouth for instance.

One of the earliest historical notices of Dartmouth relates to the year 1049,* when Swain, son of Godwin, contrived by stratagem to capture Earl Beorn, and came to Dartmouth, where he put his prisoner to death, and buried him in the church.

In 1099 William Rufus sailed from this port to Normandy.†

In 1190 Dartmouth was of sufficient importance to be chosen as the rendezvous for a fleet collected by Richard I. for the Holy Land.‡

One authority says that ten ships sailed from here (May 23rd), while another§ gives the number as one hundred and sixty-four. Both may be right; ten ships may have been provided by Dartmouth, and the remainder have come from other ports.

The next notice of interest relates to a second royal visit; viz., that of King John,|| who came here from Dorchester, on Saturday, June 18th, 1205, and stayed until June 22nd, when he returned to Dorchester. This king paid another visit to the town on Wednesday, October 15th, 1214, when he came in from La Rochelle, and left two days later for Dorchester. Leland says that "King John¶ gave privilege of Mairaltie to Dertmouth," and though there is no charter extant of so remote a date, it seems very probable that John did bestow some such mark of his favour on the town. A great number of towns were endowed with charters in this reign, and John rather encouraged the seaports of his kingdom; and, coupled with the fact of his two visits, it would seem as if the townsmen had taken advantage of his presence to secure to themselves municipal privileges. The charter,** by whomsoever granted, was confirmed in the reign of Henry III. Dartmouth, indeed, pretended, according to evidence produced before an inquisition "ad quod damnum,"†† in 1319, to have been a free borough in the reign of Henry I., but this is somewhat doubtful. In the days when corporate freedom was being sought with great eagerness, towns were apt to lay claim to the great antiquity of their rights, and

* *Saxon Chronicle*, p. 440.

† *William of Malmesbury*, p. 124. H. Hunting., M. Paris, and others, quoted in Hume.

‡ HOVEDON, Bohn, vol. ii. p. 146.

§ *Chronicle, Memorials of Richard I.* STUBBS, vol. i. p. 144.

|| "Itinerary of King John," in HARDY'S *Description of Patent Rolls*.

¶ LELAND'S *Itinerary*, vol. ii. p. 39. 1744.

** MEREWETHER'S *Municipal Corporations*, vol. i. p. 470.

†† *Ibid.*, vol. ii. p. 974.

quote charters which were no longer to be found. This was the case of Barnstaple, which claimed to have received a charter from Athelstan, and about which more than one inquisition was held in the reign of Edward I.*

The town possesses three corporate seals, one of which is modern (1836), and of no moment here. One represents a king with a three-pointed sceptre in his left hand, seated in a ship having a castle at bow and stern. On the dexter side of the figure is a crescent, and over the field are several minute dots, which may or may not be intended for stars. The legend is ✠ s' + MAIORIS + DE + CLIFONE + DERTEMVTHE + H.' "The seal of the mayor of Clifton, Dartmouth, Hardness." The three districts being combined in what is, and was, commonly called the town of Dartmouth. The crescent and star formed the badge of King John, and it is just possible that the townsmen may have commemorated the granting of the charter and the king's visit, by placing his effigy on the town arms.

The other seal is that of the borough, as distinct from that of the mayor. In this the king's head and shoulders appear in the middle of a ship, without castles at bow and stern, and there is no sceptre in the left hand. The crescent is on the dexter side of the head, and the star on the sinister, and a lion of England is placed on each side. The legend is: + SEGILLVM : COMMVNE : DE : CLIFONE : DERTEMVTHE. In this seal all doubt about the star is removed, and though to exactly resemble the badge of King John the star should be between the horns of the crescent, still it is on the seal, and not so indistinct as in that belonging to the mayor.

Copies of these seals have been submitted to Mr. Augustus Franks, of the British Museum, and he is of opinion that the mayor's seal is probably a copy of an earlier seal, and that this one is a late fourteenth century make. The borough seal is of the time of Edward I., or a little later.

Several English seaports have a ship, in some form or other, in the town arms; viz., Dover, Yarmouth, Poole, Truro, Portsmouth, Plymouth (Sutton), and many others; but the king in the ship is peculiar to Dartmouth.

From the days of John frequent notices of Dartmouth are found in the public records.

In 1298 Edward I. required a fleet for the Scotch war; and a list of the seaports, and the number of ships contributed by each, is preserved. Ipswich, Lynn, Newcastle, Scarborough, Bristol, London, Aldringham, Hampton, Cork,

* HALLAM'S *Europe during Middle Ages*, chap. viii. part iii.



— OLD SEALS OF THE TOWN OF DARTMOUTH —

and Dartmouth, send two ships each, and thirty-six other towns only one each.*

In this year (1298) Dartmouth first returned members to Parliament.† In 1310 Dartmouth again sent two ships to a Scottish expedition.‡ In 1327 Nicholas de Tewxbury, the lord of the town, transferred it to Edward III., viz., *Villam* of Clifton, Dartmouth, Hardness, and the port of Dartmouth.§

In 1337 the king granted a charter to the town.||

During the wars of Edward III., the importance of Dartmouth is very marked. On various occasions fleets assembled here from different ports prior to departing on some warlike mission; viz., 1339, ¶ 1369, ** 1370, †† and 1374 ‡‡. But the siege of Calais, in 1347, enables us to form some idea of the relative importance of Dartmouth in comparison with other English ports at that period. The king ordered every ship that could possibly be collected to proceed to Calais and take part in the investment, and the total number was 738, and in these were 14,956 seamen. §§ The complete list is much too long for insertion here, and in the following selection only the largest contributions have been given:

	Ships.	Mariners.
The King . . .	25	419
London . . .	25	662
Sandwich . . .	22	504
Winchelsea . . .	21	596
Weymouth . . .	20	264
Dertmouth . . .	31	757
Plimouth . . .	26	603
Loo . . .	20	325
Fowey . . .	47	770
Bristol . . .	24	608
Shoram . . .	20	328
Southampton . . .	21	576
Hull . . .	16	466
Newcastle . . .	17	414
Lenne . . .	19	482
Yarmouth . . .	43	1905

From this we may infer that Dartmouth was able to produce more ships and men for fighting purposes at sea than any other town in the kingdom, excepting Yarmouth and the now almost forgotten little town of Fowey.

* *Fædera*, vol. i. p. 928.

† MEREWETHER, p. 978.

§ MEREWETHER, p. 974.

¶ SOUTHEY'S *Naval History*, vol. i. p. 240.

†† *Ibid.*, iii. p. 891.

§§ "Roll of Calais," in CHARNOCK'S *Marine Architecture*, vol. i. p. 38.

‡ *Fædera*, vol. i. p. 109.

|| MEREWETHER, p. 974.

** *Fædera*, vol. iii. p. 861.

‡‡ *Ibid.*, iii. p. 1006.

That our foes in those days held Dartmouth in very high repute is evident from the various attempts, more or less successful, to attack and destroy the town. In November, 1336, the Government received intimation that an attack was to be made on Dartmouth by "aliens," and the Earl of Devon and Sir Philip de Columbers were authorized to take the necessary measures for defending the town.* Whether anything resulted from this is unknown; but, according to Froissart, the town was burnt by the French fleet in 1377, at the same time as Plymouth and some other towns, whose names and geographical positions are too ill-defined in his book to be recognised.† A much more serious affair took place in 1404, and as this event is mentioned by English as well as French chroniclers, it will be readily understood that there are two sides to the story. According to the French account,‡ Du Chatel and De Jaille fitted out an armament for a general ravaging expedition on the English coast towns; but particularly, and first of all, against Dartmouth; and this, apparently, for outrages of a like nature committed by the English on the coast of Brittany; in fact, a return match. The English had warning of what was in store for them; and when the fleet arrived, 6,000 trained men were in readiness to prevent a landing. Among other preparations for the reception of the invader was a deep trench made in the shore, leaving only a narrow causeway, which was suitably defended. This trench seems to have been more than the invaders could manage, and Du Chatel, with numbers of his followers, perished in the attempt, while a great many knights and men were made prisoners. Part of the expedition withdrew to Brittany, and after being reinforced set out once more for Dartmouth under the command of a brother of Du Chatel. This time better arrangements were made, secrecy was kept, and about a month after the first attempt he suddenly appeared before the devoted town and effected an easy capture. All the usual atrocities incidental to such occasions were perpetrated, and the visit terminated in a general conflagration.

This story received very considerable modifications in the hands of the English chronicler. No mention whatever is made of the second and successful attempt, and the first is said to have been repulsed by the peasantry of the neighbourhood, instead of the 6,000 trained men.§ According to the *Polychronicon* || the landing was attempted at Blackpool,

* *Fœdera*, ii. p. 951. † FROISSART, book i. cap. 328. Johnes.

‡ *Chronique de St. Denys*, vol. iii. 170-181.

§ WALSINGHAM, 412; Fabyan, 571; Otterbourne, 247. || f. 326.

about two miles from Dartmouth. One fact, however, is certain; the names of some of the Breton knights captured in Du Chatel's ill-fated expedition are preserved, with those of the persons who held them to ransom.*

Perhaps it was in consequence of this attack that license was given to John Corpe to embattle his house at the entrance of the harbour.†

The charter granted by Edward III. stipulated that the town was to provide two ships of war for the king's service. Evidently this was found to be a great burden, and therefore a supplementary charter granting additional privileges was given in 1341.‡ This charter was confirmed by Richard II.§

Dartmouth in Edward III.'s days must have been much richer than during the preceding reign; for in 1310 the inhabitants pleaded their inability to maintain one ship for the king's service, and the neighbouring towns of Totnes, Brixham, Portlemouth, and Kingsbridge were ordered to contribute towards the expenses.|| It would seem as if the town of Dartmouth was compelled to have one, and afterwards two ships always ready for the king's service; and this in addition to the shipowners of the port being called on to supply a certain quota to take part in any special expedition of a temporary nature. For instance, in 1310, the town sent two ships to the Scottish expedition, and the same year obtained the contributions of the neighbouring towns, because of its inability to maintain one ship. The maintenance of one or two ships for the constant service of the king would doubtless be a heavy burden on the town generally; but the temporary inconvenience of an impressment of ships for a special expedition would fall on the owners only.

The plan of causing the neighbouring towns to contribute to the expenses of the ship or ships to be maintained by one particular port applied to other towns than Dartmouth; viz., Plympton, Modbury, Newton Ferrers, and Yalmouth, were ordered to assist the town of Sutton (Plymouth); and Topsham, Levensten (Lympstone), Kenton, Powderham, and Exmouth were allotted to Exeter.¶

In order to ascertain the maritime resources of the nation, what may be called Naval Parliaments were sometimes held in London, when the king's ministers met representatives from the principal sea-ports, and so learned the number of ships and men each place could send when wanted. Dartmouth is

* *Fœdera*, vol. viii. p. 358. † *Rot. Parl.*, 4 Henry IV., part ii. 30.

‡ MEREWETHER, p. 474. § *Ibid.*, p. 475.

|| *Rot. Scot.*, vol. i. pp. 90, 91. ¶ *Rot. Scot.*, vol. i. pp. 90, 91.

recorded as sending one and sometimes more deputies to this meeting. In the list of those attending on such an occasion, in 30 Edward III., is found the name of Will^a Smale de Dertmuth *cum aliis mercatoribus*.*

It may almost be said that in the fourteenth century there was no Royal Navy. Of the 738 ships at the siege of Calais, only 25 belonged to the king, and these did not carry on the average seventeen men each. There were certain towns like Dartmouth, bound by their charters in return for municipal privileges, to keep a ship or ships always ready for the king's service; but these were not many. The Cinque Ports were expected by their tenure, upon forty days' notice, to supply fifty-seven ships, with twenty-one men and a boy in each ship, for fifteen days, once a year.† This mode of service, however, could not be used in times of peace, and, consequently, impressment in one form or other, both of ships and men, was frequently resorted to. There are numerous notices in the Records of orders sent to this or that port to send so many ships and men for the king's service. If the town showed any reluctance to obey, an order would be issued "to arm, equip, and send to sea, all the ships in the port;" as happened in the case of the citizens of London in 1336.‡

There was no need to foster the combative element in the seafaring population of this period; there was quite enough of that under ordinary circumstances; but the frequent liability to military duty during the long series of wars in the reign of Edward III. must have developed it to a greater extent, if possible, than was natural. In addition to doing the fighting of the king, when called on for that purpose, the sailors had also private wars of their own to attend to. The distinction between piracy and legitimate commerce was so ill-defined as at times to be lost sight of altogether. Every foreigner was fair game, and if an English captain passed a stranger it was only because the experiment seemed doubtful of success, and if he did get the upper hand, well—

"By water he sent hem hoom to every land ;"

in other words, threw them overboard, or made them "walk the plank." The foreigner in his turn acted in the same way, and without scruple; indeed, the state of affairs in seafaring life must have been far from tranquil. Every sailor was a fighting man, ready for action at the shortest

* *Rot. Parl.*, vol. ii. p. 457.

† CUTTS, *Scenes and Characters of the Middle Ages*, p. 480.

‡ *Rot. Scot.* vol. i., p. 430.

notice, and every ship must have been armed more or less.

There was a very numerous class of seamen who were called pirates, but who were not considered in quite the same light then, as they would be now. They were common to all nations in Europe; they plundered both friend and foe alike; and their fighting qualities were frequently hired by various kings, who would dismiss them to their ordinary occupation when their services could be dispensed with. This class was recruited from among the boldest and most skilful seamen of the age; and any desperate and discontented man would be sure of a hearty welcome among them if he only had services to recommend him. The pirate of one day might, by way of a change, be the (one degree milder) peaceful sailor of the morrow, or *vice versa*. In the one case he would be guarding the merchandise of the ship he was in, and in the other, he would be ready to plunder the contents of the first vessel he met. There is every reason to believe that when freights were scarce, a fillibustering expedition on the opposite side of the Channel would serve to find the crews employment and keep them together until better times. The men of the Cinque Ports must have been great adepts at this pursuit—"they slew and plundered like pirates."*

No government seems to have been strong enough to control this lawless state of feeling; the utmost that seems to have been attempted was occasionally to make an example of some very bad case, or to utilize it to their own purposes. There was a constant exchange of remonstrances in time of peace, between the various sovereigns who ruled the coasts; but with little avail. The usual mode of granting redress was to give the injured individual letters of marque, and then allow him to help himself, and take the law in his own hand.† There is a passage in the "Libel of English Policy" which alludes to this. After describing the efforts made by Edward III. to induce the Duke of Brittany to curb the marauding habits of the men of St. Malo, it proceeds—

"He did dewise
Of English Towns three, that is to say,
Dertmouth, Plymouth, the third it is Fowey :
And gave them help and notable puisance
Upon pety Bretayne for to werre."‡

Means of communication on land may have been hazardous, but they could not have been worse than the highway at sea.

* MATTHEW PARIS.

† LYNDSEY, vol. i. p. 431.

‡ "Libel of English Policy," in HACKLUTT'S *Voyages*, vol. i.

This state of uncertainty must have had a deterrent effect on a commercial enterprise pure and simple. It would seem as if all acted on

“The good old rule, the simple plan,
That they should take who have the power,
And they should keep who can.”*

The following instances will suffice to show how very impartial the seamen of the fourteenth century were in their plunderings; their own countrymen were not passed over to the detriment of the foreigner.

In 1314, William de Huntingdon complained to the king, that he had gone to the port of Dublin with his ship and cargo, and that while there John de Lung, of Bristol, “*et quidem alii malefactores et piratæ*,” had captured his ship and contents, and which ship was afterwards burnt.†

William de Forbernard, a Gascon, was stopped off the Foreland by Peter Bert of Sandwich, Gervays Alard of Winchelsea, and Robert Cleves of Greenwich, and robbed by them of over eighteen tons of wine.‡

In 1322, two merchants of Sherborne, in Dorset, complained that when their ship, laden with cloth and canvas, was off Portsmouth, she was boarded by Robert de Battayle, and others of the Cinque Ports, and eighty pounds’ worth of her cargo carried away.§

In 1324, the *Annot*, of Ditton, laden with fish for the king, was boarded near Lynne, by John Russell and others, of Spalding, who killed the crew, and took the vessel to Seaford, where the ship and cargo were sold.||

It must not be supposed that the men thus accused of what we should to-day call piracy, were simply seamen and nothing more. Some of them at least were men of importance in their calling. Peter Bert, or Bard, in 1314, commanded a fleet for the king; Gervase Alard had command of a fleet in a Scottish expedition in 1300; and Robert Battayle was an eminent seaman, Mayor of Winchelsea in 1335, but often complained of on account of his plundering ships.¶

There were certain expeditions on which it was quite impossible to venture, except in such numbers as would defy attack. It was the custom to go to Bordeaux once a year to fetch wine, and Froisart describes a fleet of “*deux cents nef*s

* WORDSWORTH’S “Rob Roy’s Grave.” † *Rot. Parl.*, i. p. 327.

‡ *Ibid.*, p. 406.

§ *Ibid.*, p. 413.

¶ NICHOLAS’ *History of British Navy*, vol. i. p. 361.

¶ *Ibid.*, pp. 395, 410, 420.

d'une voile, marchans d'Angleterre et de Galles et d'Ecosse,"* who had come together for the sake of the safety which is supposed to lie in numbers. Sometimes an officer of the king was appointed to accompany this fleet and arrange for its safety.† Pirates in large numbers were frequently on the look-out to waylay the yearly wine fleet, and made great plunder. The members of the fleet were obliged to support each other in case of attack; and when a loss happened from the cowardice of such as took to their heels, instead of fighting, the fugitives were compelled to compensate the owners of the lost vessels.‡

Occasionally the fleet would do a little wholesale fighting with the wine fleet of some other nation, which they met and fell out with at Bordeaux. In 1390 there had been a quarrel between the English and Norman sailors;§ and the governor of Bordeaux thought it requisite to call the captains of both sides together, and made them swear to, what we should now call, keep the peace towards one another, not only at Bordeaux, but what he thought of as much importance—after they had left the port. When the English had received their cargoes, they left the port by fours, fives, six, &c., in the most peaceful manner, and went their way. The Normans, however, suspected that the English would meet outside the Gironde, and lie in wait; so before leaving the port, they prepared their ships, eighty in number, for the anticipated fight, by erecting castles fore and aft, and on the mast, and then started in company. This case is very instructive, because it shows that the English, leaving first, were obliged to go in numbers for mutual defence; secondly, the facility with which the merchant-ships of the period could be prepared for war; and thirdly, that they expected the English, though leaving so peacefully, would combine and give battle; and hence the whole eighty Norman ships kept together to resist the anticipated attack. There are many records of these wine fleets coming in collision, on the way to, as well as coming from Bordeaux; and this happy state does not seem to have been influenced by the fact of peace or war existing between the respective nations.

In addition to fighting the national foes, either for the king or on his own behalf, not to mention occasional piracy, a fruitful source of coming to blows was the animosity which existed between the sailors of different English ports.

* Quoted in MICHEL's *Histoire de Commerce*, vol. i. p. 52.

† *Rot. Vasc.*, 30 Edward III. M. 2. ‡ MICHEL, vol. i. p. 56.

§ *Ibid.*, pp. 98, 99.

In 1264, there was a conflict at sea between the men of Lyme and the men of Dartmouth, and the king was obliged to issue a writ of enquiry, and order the sheriffs of each county to assist the commissioners. *

In 1297, while at Sluys, in the presence of the enemy, the men of the Cinque Ports and of Yarmouth fell out, and twenty-five Yarmouth ships were burnt and the crews killed. †

Camden, writing of Yarmouth, says that (1340) the citizens walled the town round, "and became so rich and powerful that they often engaged the men of Lowestoff in sea-fights with great slaughter on both sides." ‡

In 1321 the king tried to make peace between the mariners of the Cinque Ports, Poole, Weymouth, Lyme, and Southampton, which led to murders, robbery, and burning of ships. §

In 1336 the utmost precautions were necessary to prevent the Yarmouth and Cinque Ports contingents from coming in contact while forming part of a fleet on a Scottish expedition. ||

In October of the same year, the king had to take measures to prevent the seamen of Little Yarmouth and Goreslton from fighting with those from Great Yarmouth while on a Scottish expedition. ¶

In 1342 the principal inhabitants of Yarmouth were fined 1,000 marks for committing trespasses and other unwarrantable acts on the sea coast. **

In 1385 the English admiral dared not attack the French fleet on account of the dissensions existing among the various contingents of his own fleet. Cowardice was out of the question; for on this very occasion the Portsmouth and Dartmouth men, "hired by none, bought by none, but spurred on by their own valour and innate courage," as Walsingham says, †† with a very small force made great havoc among the French ships in the Seine, sinking four and capturing four, one of which was worth 20,000 florins.

This unity of feeling appears to have kept the Dartmouth and Portsmouth men together on a previous occasion; viz., 1383, when they gained a victory over some French vessels; ‡‡ and certainly the amity which appears to have existed between these two ports is conspicuous for its singularity among so many animosities.

Sometimes this fighting capacity of our English seamen

* *Rot. Patent*, 48 Henry III.

† KNYGHTON, 25, 12.

‡ ROBERTS' *Social History of Southern Counties*, p. 75.

§ NICHOLAS, vol. i. p. 336.

|| *Fœdera*, vol. ii. p. 943.

¶ *Rot. Scot.*, i. 458.

** ROBERTS, p. 76.

†† WALSHINGHAM, p. 342.

‡‡ *Ibid*, p. 331.

was utilized by private individuals for the public benefit, when the State failed to do its duty. In 1378, a Scotchman, named John Mercer, had gathered together a number of Scotch, French, and Spaniards, and for a time did pretty much as he pleased on the eastern coast; among other exploits, capturing certain Scarborough ships, killing the captains, &c.* The weak rule of Richard II. could afford no redress; and John Philpott, a citizen of London, hired ships, and 1,000 armed men, and set out to meet Mercer, whom he defeated, and thus recovered the Scarborough ships, and at the same time captured fifteen Spanish wine ships which had gone to the assistance of the Scotchman.

This gallant action was not appreciated at Court, and Philpott was called before the Council, when he was severely rebuked by the Earl of Stafford. Philpott's reply was as creditable as his exploit. He said:

"I did not expose myself, my money, and my men to the dangers of the sea, that I might deprive you or your colleagues of your knightly fame, nor acquire it for myself; but from pity for the misery of the people and the country, which, from having been a noble realm with dominion over other nations, has through your supineness become exposed to the ravages of the vilest race; and since you would not lift a hand for its defence, I exposed myself and my property for the safety and deliverance of our country. To this taunting speech the earl had not a word to answer."†

Another instance, but of a somewhat doubtful nature, occurred in 1389, when a Dartmouth merchant attacked and captured thirty-two vessels, laden with wine, from the enemy.‡ This was probably John Hawley, and evidently, from what we learn of him, he knew how to take the law in his own hands, in more senses than one. This worthy, on one occasion, seized the ships and merchandise of another English merchant, one Roger Brymour, at Guienne, on some very trivial pretext.§ Hawley's son, too, knew how to look after his own interests. Another Dartmouth merchant, named Edmund Arnaud, was indebted to Hawley, senior, on whose death the son sent to Bordeaux, and seized the ships of his father's debtor, to satisfy the claim.|| In 1402, Hawley was summoned before the Council, to explain some similar conduct of his in respect to certain Flemings, with whom he had business transactions of a piratical nature.¶ Lyndsay says "that

* WALSINGHAM, p. 213.

† *Ibid.*, p. 213.

‡ KNYGHTON, *Col.* 27, 85; and WALSINGHAM, p. 336.

§ MICHEL, vol. i. p. 82. || *Ibid.* ¶ *Rot. Claus.*, 4 Henry IV., m. 81.

the Dartmouth men took the lead in these semi-piratical acts, as they held from the king a general privateering commission."*

To such a state of perfection had the warlike propensities of the English merchant sailor been developed, and so feeble had the powers of the Crown become, that, in 1406, the merchants, mariners, and shipowners undertook for the Government, on certain conditions, the safe custody of the entire coast; and this contract was maintained for eighteen months. They appointed their own admirals, made every arrangement, and appear to have done their duty by the Government.†

As might have been expected, the seafaring class then, as now, had peculiar laws suitable to the life on board ship, and certainly in the thirteenth and fourteenth centuries, consistent with the times, these laws were very cruel. Richard I. is credited with having compiled, or framed, the short but draconic code of laws, called *Rôles d'Oleron*, but which was also known by the name of the Code of Wisby.‡

I. If any man kills another in the ship, he shall be fastened to the corpse, and thrown into the sea.

II. If he commits murder on the land, he shall be bound to the dead man, and buried with him.

III. If any one shall have been convicted by lawful witnesses of having drawn his knife to strike another, or shall have actually done so to the effusion of blood, he shall lose his hand; but he, who shall have struck another with the palm of his hand without shedding blood, shall be three times ducked in the sea.

IV. If any one shall abuse, insult, or privately slander his fellow, he shall pay an ounce of silver for every offence.

V. A robber, convicted of theft, shall be shaved in the manner of a champion, and boiling pitch poured upon his head, and the feathers of a pillow shaken over his head to distinguish him, and be landed at the first port when the ship shall stop. §

It is generally supposed, strange to say, that this code of laws was first intended for the discipline of bodies of pilgrims on their way to the Holy Land.

In addition to these there were others, which, if not written at this period, were certainly understood, and which served to define the relations which existed between the captain and the owner of the ship, and the captain and his crew. These have been collected by M. Pardessus, and they show that though the times were rough, still equity and

* LYNDSEY, *Merchant Shipping*, vol. i. p. 432.

† Full details of this contract are given in NICHOLAS, vol. ii. p. 384, *et seq.*

‡ LYNDSEY, vol. i. p. 392. § FOSBROKE, *British Monachism*, p. 351.

justice were not altogether forgotten, and that the seamen had their due.*

We are able to ascertain the earnings of the captains and sailors, at all events when hired by Government, as the warrants for payment are preserved in the State records.

In 1370, September 22nd, James Treverbien and John de Clyfton were directed by the Lord the King and his Council to pay the wages of the seamen at Dartmouth, who were employed in the passage of Guydo de Bryene beyond the seas, at the rate of each master, or constable, 6d. per day, and each mariner 4d. per day, by reason of the dearness of provisions that year.†

In another entry, the same year, for the passage of William Huet to Gascony, the master and constable were to be paid 6d. per day, and each mariner 3d. per day, besides 6d. per week, on account of dearness of provisions.

The sums paid in Dartmouth in 1370, as wages to masters and seamen, for carrying various officers and soldiers to Gascony were—

				<i>s.</i>	<i>s.</i>	<i>d.</i>
May 29th	.	.	.	266	13	4
June 26th	.	.	.	400	0	0
July 23rd	.	.	.	600	0	0

The general payment seems to have been 6d. per day to the master of the ship, and 3d. per day to the seamen. This must have been worth at least ten or twelve times as much, considering the relative value of money.‡

The seaman's patron saint was, according to Peter de Langtoft—

“The Bishop St. Nicholas, whose help is ay redie
To Shipmen in all cas, whan thei on him crie.”

But instances are recorded of appeal having been made to St. Thomas of Canterbury, and with good result.

No description of the sailor of this period, however carefully worked out, could possibly be so accurate as the celebrated one by Chaucer—

“A Schipman was ther, wonyng fer by weste :
For ought I woot, he was of Dertemouthe.
He rood upon a rouncy, as he couthe,
In a gowne of faldyng to the kne.
A daggere hangyng on a laas hadde he
About his nekke under his arm adoun.
The hooete somer hadde maad his hew al broun ;

* LYNDSEY, vol. i. p. 379, *et seq.* ; also *Black Book of the Admiralty*, by TWISS.

† *Issue Roll of Thomas de Brantingham*, 44 Edward III.

‡ *Ibid.*

§ *Ibid.*

And certainly he was a good felawe.
 Ful many a draughte of wyn hadde he ydrawe
 From Burdeux-ward, while that the chapman sleep.
 Of nyce conscience took he no keep.
 If that he faughte, and hadde the heigher hand,
 By water he sente hem hoom to every land.
 But of his craft to rekne wel his tydes,
 His streemes and his daungers him bisides,
 His herbergh and his mone, his lode menage,
 Ther was non such from Hull to Cartage.
 Hardy he was, and wys to undertake;
 With many a tempest hadde his berd ben schake.
 He knew wel alle the havenes, as thei were,
 From Gootland to the Cape of Fynystere,
 And every cryke in Bretayne and in Spayne;
 His barge y-cleped was the Maudelayne."

By Chaucer's fixing on Dartmouth as the port from which his "shipman" hailed, he testifies to the importance of the town, and at the same time affords evidence that the men from this port were well known.

Of course fun is made of the shipman's riding, and that joke has been oft repeated. Doubtless to go on a pilgrimage to Canterbury the shipman would don his best attire; but the "gowne of faldyng to the kne" is simply graphic. Faldyng was a coarse frieze cloth of a very unfinished sort, and very likely, in this instance, to have been made in one of the many Devonshire looms. Large quantities of this cloth were made in England, and exported to other countries. The long blue gown, to the knee, tightened at the waist, or worn loose, according to taste, is no longer the costume of sailors generally, but it is still to be seen occasionally among the fishermen and others at the little seaside villages in Devon and Cornwall, and perhaps elsewhere.

If rumour is to be relied on, the sailor of to-day is quite as capable of testing the quality of the cargo as ever his predecessors were. But this weakness is not confined to the seafaring part of our population engaged in the carrying trade.

Allusion has been already made to his combative nature, and of the treatment of the defeated. In this matter, however, he was no worse than his neighbours, and simply did as he expected he'd be done by.

If Chaucer is supposed to express the opinion of the day as to the nautical attainments of the Dartmouth sailors, it speaks well of the port; for this individual appears to have known all the places frequented by merchant ships in his time. To Gootland, and its ancient capital Wisby, he would take wool, and the coarse cloth manufactured in the district;

and bring back corn, wood, and tar.* In the "Easterling" trade generally he would carry wool, cloth, worsted, and leather; and his return cargo would consist of iron, wood, hemp, tallow, wax, and furs. Wool would also be carried to Spain, Calais, and the Low Countries. The Spanish wool could not be made into the finest cloth without an admixture of English wool.

"The wool of Spaine it cometh not to preesse;
But if it be costed and menged well
Amongst the English wolles the greater delle." †

From Spain and the Low Countries the imports would include the fine cloths made by this mixture of Spanish and English wool.

Wool and leather would also be carried to Bordeaux and to Spain; and wines and cloth, and merceries generally, brought back. ‡

Dartmouth at one time (1390) was the port from whence all the tin raised in the kingdom was shipped, and this alone must have been a means of bringing great wealth to the town, and giving employment to numbers of vessels.§

Another source of profit was the carriage of pilgrims to the shrine of St. Iago de Compostella. Early in the fifteenth century this pilgrimage appears to have been very fashionable, if we may judge by the numbers of ships licensed for that purpose. The names of some of the vessels leaving the Dart, with the numbers of pilgrims carried, are preserved in Rymer:

Date.	Owner or Master.	Pilgrims.	Name of Ship and Port.
1428	Thos. Buk	40	Thomas, of Dartmouth
"	John Stanbury	50	Trinity, of Dartmouth
1434	J. Heddon	40	St. James, of Kingswear
"	J. Lye	40	Anthony, of Dartmouth
"	R. Walter	60	Peter, of Dartmouth
"	John Godyng	30	Thomas, of Dartmouth
"	John Lysard	40	Catherine, of Dartmouth
"	J. Colman	30	Lawrence, of Dartmouth

These dates are later than the period generally treated of in this paper, and the names are simply given as specimens of the size of vessels generally in use. ||

The artistic powers of the thirteenth and fourteenth centuries were extremely limited, and consequently such

* PAULIS, *Pictures of Old England*.

† "Libel of English Policy."

‡ MICHEL.

§ CRAIK, *British Commerce*, vol. i. p. 144.

|| For a more extended list see ROBERTS'S *Social History of Southern Counties*, p. 130, *et seq.*

representations as we have of the ships of this period are not of a very high order. In one respect, however, they seem to agree; viz., they show no ship with more than one mast, at least as late as 1410.*

In the public records are allusions to various sorts of vessels, some of which it is impossible to define at the present day. For instance, "cogs," "galleys," "barges," "crayers," "carracks," "ballingers," "flutes," "lynes," "keels," "hoc boats," "pickards," "busses," &c. The cog is the species of merchant vessel most often mentioned, and was probably the best in existence, at least in English waters, with the exception of the Spanish carrack, which was a much larger vessel, but not often employed by the English until a somewhat later period.† The cog was short and broad, somewhat resembling a cockle-shell, from which its name is said to have been derived. The average tonnage was 200 to 250 tons, though there is mention of one, viz., the *Christopher*, of Exmouth, which was 300 tons.‡ It was capable of carrying ten, twelve, and even fifteen horses amidships; § and for naval purposes about sixty-five soldiers and archers to each hundred tons burthen, in addition to the crew.

The barge resembled the cog in many respects, but was somewhat smaller.||

The rudder was commonly in use by the end of the thirteenth century, though the old-fashioned plan of steering by a long oar took a considerable time to die out. Seldom but one sail was used, though greater speed was obtained by an additional sail called a "bonnet."

In the *Merchant's Second Tale* these bonnets are mentioned, (l. 868-71)—

"Lodisman

Stere onys into the costis as well as thou can;
When our shippis be ycom, that we now pass in fere,
Lace on a bonnet or tweyn, that we may mowe sail nere."

It was customary to paint the sails more or less splendidly; at all events those of the wealthy were so treated. The ship in which Richard II. came from Ireland had a sail on which was represented a flaming sun. (See copy of illumination.)

In fact a large amount of money was spent in adorning the ships in which great personages embarked. Froissart, speaking of the French fleet in 1386, prepared for the invasion of England, says: "Each Lord strove to have his

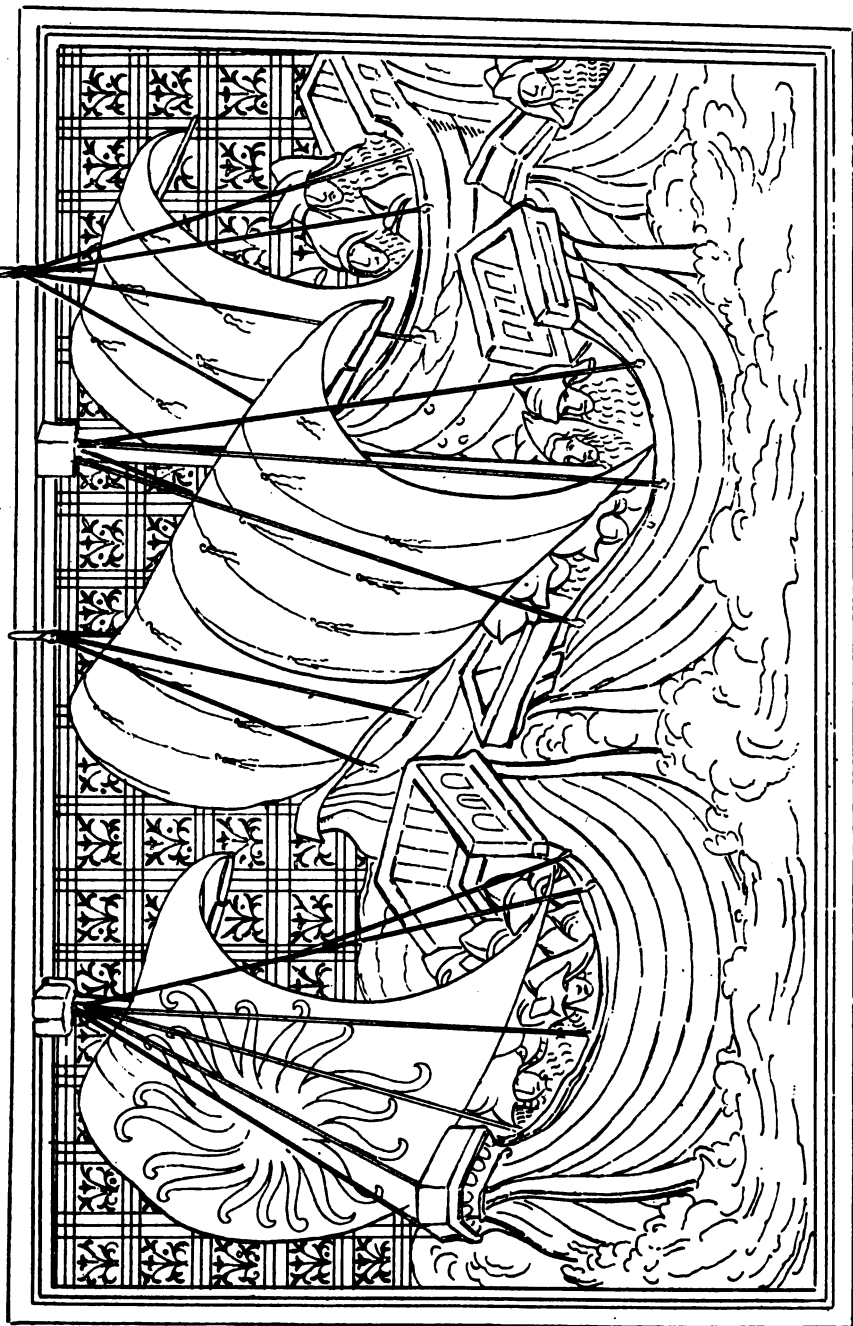
* NICHOLAS, vol. ii. p. 448.

† *Ibid*, vol. ii. p. 156.

‡ *Ibid*, vol. ii. p. 158.

§ "*In medio navium*," Rot. Parl. Claus, 147.

|| NICHOLAS, vol. ii. p. 158.



ILLUMINATION IN A FRENCH METRICAL HISTORY OF THE DEPOSITION OF RICHARD II.
ARCHAEOLOGIA. VOL. XX.

vessel the best supplied, and most ornamented with painting and gilding, and with their arms emblazoned on them and on the flags. The masts were painted from top to bottom, and some were covered with sheets of fine gold. Sir Guy de la Tremouille expended two thousand francs in ornamenting and painting his ship." * In the *Golden Targe*, by Dunbar, a ship is seen approaching in a vision, whose sails are like the "blossoms upon the spray," and whose masts are of pure gold, bright as the "star of day." †

The process of preparing a merchant-ship for fighting purposes was a very simple one. Three castles were made and affixed to the ships: one on or near the top of the mast, the topcastle; one on the bow, the forecastle; and one at the stern, called the "ofcastle," or aftcastle. These castles were made by a special class of artizan called "castlewrights." ‡ The part occupied by the forecastle was called the fore stage.

"He danced for joy on the fore stage." §

The names of the various ropes, blocks (pulyves), cables, rings, &c., &c., are still to be found in the many ships' accounts of the period. One in particular is very interesting; viz., an indenture of the Mayor and Aldermen of London, 1373, which gives a list or inventory of the rigging, tackle, &c., of a barge provided by the city to serve under the king. ||

The compass, in some primitive form, was in use in the fourteenth century. In 1306, Robert King of Scotland, when crossing from Arran to the coast of Carrick, in the night time, steered by a fire on the shore.

"For thay nà nedil had nore Stàne." ¶

Chaucer, in his *Astrolobie* (1391), alludes to the fact of the shipman reckoning thirty-two points of the horizon; which seems to refer to the modern division of the compass. At night time the pole-star was the guide to steer by, and, as might be expected, in certain weather this was invisible.

"For they were cleen in dispeyr, because they myghte not se
The loder where by these shipmen ther cours take eche one." ***

There are many early notices of the magnetized needle being used by sailors when the polar-star was invisible.

* FROISSART, book iii. cap. 37.

† WHARTON'S *English Poetry*, vol. iii. p. 211. Hazlitt's Edition.

‡ NICHOLAS, vol. ii. p. 169. § *Merchant's Second Tale*, l. 2199.

|| RILEY'S *Memorials of London*, p. 368.

¶ BARBER, writing in 1375. ** *Merchant's Second Tale*, l. 836-7.

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“Quand le mer est obscure et brune
 C'on ne voit estoile ne lune
 Dont font à l'aiguille alumer
 Puis n'ont il garde d' esgarer :
 Contre l'estoile va la pointe
 Por ce sont le marinier cointe
 De la droite voie tenir.”*

In a fragment of a song of the thirteenth century the method of steering by the polar-star (tresmontaiyne) is given, and also the mode of using a needle touched by the magnet (aimant)—

“Qui une aiguille de fer boute
 Si qu'ell pert presque toute
 En-j-poi de leige et l'atise
 A la pierre d'aimant bise,
 S'en-j-vaissel plain d'yaue est mise,
 Si que nus hors ne la deboute,
 Si tost comme l'yaue s'aerise
 Car dous quel part la pointe vise
 Le tres montaigne est là sans doute.”†

From these quotations, and other evidence in plenty, it would appear that, when the pole-star was invisible, a primitive compass was made by fixing in a cork a needle which had been touched by the magnet, and floating it in a vessel of water.‡ Among the stores supplied to the barge *Mary*, of the Tower, in 1338, were two sailing needles and a dial.§

This same barge had on board an iron cannon with two chambers, and another of brass with one chamber. Details also of powder, iron spoons to make bullets, and other requisites for artillery practice are given; and thus we know that ships in the fourteenth century were sometimes armed with cannon.||

Of the freights paid for merchandise, at all events in respect of Dartmouth ships, there are but few records at hand. The following, in 1409, is a specimen:

“The *Marie de Dartmouth* laden with fifty-four bariques of wine at Bordeaux for John Orguiner, merchant of Chester, was paid thirteen shillings a ton freight; and the *Marguerite de Kingsware*, laden with wine for Beaumaris and Dublin, was paid twenty shillings per ton.”¶

In looking through the various authorities quoted in this paper, the names of several vessels belonging to the port of Dartmouth have been found; and, although anxiously searched for, still it must be owned that no notice anywhere has been discovered of “the barge y-cleped the Maudelayne.”

* JAL., *Archæologia Naval*, vol. i. p. 206. † *Ibid.*, p. 209.

‡ See also MACPHERSON'S *Commerce*, vol. i. p. 361, *et seq.*

§ NICHOLAS, vol. ii. p. 180.

|| *Ibid.*, pp. 186-7.

¶ MICHEL, vol. i. p. 125.

NOTES ON RECENT NOTICES OF THE GEOLOGY AND PALÆONTOLOGY OF DEVONSHIRE.

PART VII.

BY W. PENGELLY, F.R.S., F.G.S.

(Read at Totnes, July, 1880.)

THE Seventh instalment of *Notes on Notices of the Geology and Palæontology of Devonshire* consists of comments on one *Notice* of the Bovey Lignite Formation and on several *Notices* of Kent's Cavern. One of the latter, however, will be found to have furnished material for upwards of 80 per cent. of the space occupied by the whole.

I. MR. J. STARKIE GARDNER ON THE BOVEY LIGNITE FORMATION, 1879.

Mr. John Starkie Gardner, F.G.S., M.G.S., of France, &c., in a paper *On the Correlation of the Bournemouth Marine Series with the Bracklesham Beds, the Upper and Middle Bagshot Beds of the London Basin, and the Bovey Tracey Beds*, published in the *Geological Magazine*, for April, 1879, New Series, Decade II., Vol. vi. pp. 149–154, states, when writing of the well-known Lignite formation at Bovey Tracey, South Devon. "Forbes, in speaking of them" [*i.e.* the beds of clay, sand, and lignite], "says:—'The present geographical limits of the deposit may have scarcely any relation to its original extension. It is interrupted by considerable faults; and the beds are occasionally disposed at high angles, which have no relation to the present surface-contour; and it seems probable that they may be but a remnant of the original formation, which has been protected from denudation in the Bovey Valley.'" p. 153.

For this quotation from "Forbes," Mr. Starkie Gardner refers to *Quart. Journ. Geol. Soc.* vol. ix., but without giving the page. The volume, however, contains a paper

entitled *On the Fluvio-Marine Tertiaries of the Isle of Wight*. By Professor Edward Forbes, F.R.S., Pres. G.S., &c. (pp. 259-270), and presumably the paper Mr. Gardner had in view; but, so far as I can discover, no such passage occurs in it, nor, indeed, does it contain any mention of the Bovey Formation or district.

Prof. E. Forbes was President of the Geological Society in 1853, and his Address from the Chair, on 18th February that year, appears in the volume of the Society's *Quarterly Journal* now under notice, but that, too, is quite silent respecting Bovey Tracey.

Mr. Starkie Gardner, whose attention I directed to the matter in August, 1879, replied that he had ascertained that the reference was wrongly given, and failed to find the quotation in the Geological Journals. He added, "I cannot tell whether it is my mistake or the printer's, as I did not have the MS. back to correct my proofs by. I will try and clear the mistake up when I go back to London." He was writing when from home, but up to the present time the correction has not been made, so far as I am aware. There is no doubt that the quotation is discoverable somewhere; and my object in Noting the matter is to add the request that any reader who may find it, will be so good as to inform me of its whereabouts.

II. DR. A. LEITH ADAMS ON KENT'S CAVERN, 1879.

In the Monograph on the *British Fossil Elephants*. By A. Leith Adams, M.A., M.B., F.R.S., F.G.S., Part II., 1879. (*Pal. Soc.*), the author directs attention to fifteen milk-molars of the Mammoth (= *Elephas primigenius*, Blum.) found at various times in Kent's Cavern, Torquay, by the Committee appointed by the British Association for the exploration of that famous mausoleum. Speaking of the specimen No 2, in the "find" 3489, Prof. Adams says, "Smerdon's Passage, 4-foot level, with teeth of Hyæna, Horse, Irish Elk, and Rhinoceros, October 6th, 1870;" and has therein made a *Slip*, as the specimen was found in Smerdon's Passage, in the fourth foot-level of Cave Earth, with 1 tooth of Ox, on 21st October, 1870.

III. MR. JOHN ELIOT HOWARD, F.R.S., ON THE CAVES OF SOUTH DEVON, 1879.

On Friday, 31st January, 1879, I received the following note:—

"Victoria Institute or Philosophical Soc^y. of Great Britain.
7, Adelphi Terrace, London, W.C.

Jan. 29, 1879.

Sir:—The Council requests the pleasure of your company on Monday next at 8, when the enclosed will be read, and hope you will take part in the discussion.

I am,

Yours faithfully,
(Signed) F. PETRIE,

Hon. Sec."

The "enclosed" mentioned by Capt. Petrie was a Proof copy of a Paper entitled *The Caves of South Devon and their Teaching*. By JOHN ELIOT HOWARD, F.R.S. I had not previously heard that such a paper was to be read or, indeed, written, and was unable to do more in my reply, dated "Torquay, 1st Feb., 1879," than to express my regret that, on account of the shortness of the notice, and the pressure of engagements, it would not be in my power to attend; to state that, though I had not had time to glance at more than a page here and there of the Proof, I had detected one important error, which I corrected; to add that I should take such course respecting the paper as might seem called for; and that I expected the same publicity to be given to my note as to the paper.

Several letters passed subsequently between Capt. Petrie and me, which, for the present, may be thus briefly summarized:—

Capt. Petrie desired

1st. To receive from me, for publication, and within a specified time, MS. comments on Mr. Howard's paper.

2nd. To suppress the publication of my letter of 1st February.

3rd. To receive from me a copy of any reply I might publish elsewhere.

To the first, I answered that a reply to the paper would require more space than I could ask him to give me, that it could not be ready within the time he had specified, and that I should avail myself of some other channel.

To the second, I did not consent; but remarked that, as he had sent me printer's proofs of my letter, which I had returned corrected, I had been led, and allowed, to understand that it would be printed with Mr. Howard's paper.

To the third, the only reply possible was that it would afford me great pleasure to comply with the request.

During this correspondence I was astonished to find, on 24th March, 1879, in a bookseller's shop at Torquay, a large supply of copies of Mr. Howard's paper, in the form of a pamphlet, entitled the *People's Edition*, without any indication that it had been read to any society, but published apparently as an independent work, and having no mention of, or reference to, my note.

I cannot but feel that I may congratulate myself on the supply of materials which members of the Victoria Institute have found in my Reports and Papers. I do not recollect having ever seen a copy of the *Journal* of the Institute, but a sufficient number of reprints of papers from it have come under my notice to show that Mr. Howard's is at least the fourth in the series in which I have been made to figure somewhat conspicuously.

In the following pages I purpose quoting from Mr. Howard's paper each passage, in the order of pagination, which appears to require or invite remark, and to couple with it all closely related passages on subsequent pages. It is to be feared that, as Mr. Howard does not appear to be a very methodical writer, my plan will oblige me to skip at times from one page to others. The quotation being made, I shall offer my comments on it before proceeding to quote the next passage; and so on to the end.

The quotations will in all cases, except the first, be made from the printer's proof, not the *People's Edition*, as at least some of the few corrections made in the latter resulted from my note of 1st February, 1879; such corrections, however, as the author has made will be scrupulously mentioned.

It will be my endeavour to quote with literal accuracy in all cases; to verify all Mr. Howard's quotations which I may have to re-quote; to refer to the source whence every passage I quote is taken; to indicate the interpolation of any word or words I may have to make in a quotation; and to place within inverted commas every word I quote, so that what is mine, as well as what is not, may easily and plainly be determined.

Mr. Howard's Personal Investigations.

Quotation I, A: "The author" [Mr. Howard] "describes the rise and progress of the new views as to the 'Antiquity of Man,' in part connected with and resulting from researches in the South Devon caves, especially Kent's Cavern.

"From personal investigation of this cave, and from careful comparison of the evidence brought forward by others, he calls in question the long chronology assigned to the human race by Mr. Pengelly and others." *Wrapper of People's Edition*, p. 2.

B. "It has only been by long investigation that I have discovered these confirmations of my original impressions." *Foot-note*, p. 9.

C. "I should recommend all who explore these caverns not to trust to the light provided by their guides, but to carry with them the bright guidance of their own common sense; or, if this be considered too fatiguing, to receive at my hands the torch of a salutary scepticism, which will disclose the unreality of the spectres that meet their view." p. 19.

On 10th June, 1878, Mr. Howard wrote me as follows: "I hope to be at Kent's Cavern to-morrow afternoon, at 3 p.m. (Tuesday.) If I could have the pleasure of seeing you there it would add to our interest, as I shall bring a friend with me." In compliance with his request, I met him at the Cavern entrance on the following day, 11th June, when he was accompanied by a gentleman, and I by one gentleman and two or three ladies. This, so far as I am aware, was the only time that I ever saw Mr. Howard. He appears to have made the Cave a visit a few days before, when he was conducted by the authorized guide—the foreman of the excavators employed by the British Association Kent's Cavern Committee. The guide informed me that he had a vague impression that the same gentleman had been there once before. Mr. Howard, however, speaks of having "first visited the place in 1869, under the guidance of Mr. Pengelly" (p. 9); but I have no recollection of it, nor does his name occur in my Journal, where the names of gentlemen who accompany me are recorded.

But waiving this; on 11th June, 1878, I took him, and the rest of the party, to the spot where the men were at work, and he saw the deposit *in situ*, but he made no examination of anything, and had he attempted to excavate in any way he would have been respectfully but firmly requested to desist, in accordance with the rule laid down and observed strictly in such cases.

The same course must have been followed in 1869 if I conducted him then; but on his first visit in 1878, he was certainly not taken to the spot where the excavation was in progress, the guide being strictly prohibited from taking any

visitor to the "diggings," as well as to parts of the Cavern where the work had not been begun.

When with me his stay could not have exceeded half an hour, and I feel assured that in all his visits taken together, he has not spent more than two, or say three, hours in his "personal investigation" in the Cavern.

Again, there are numerous and important branches of the Cavern which he has never seen. He certainly never set his foot within the "South Sally Port," or the "North Sally Port" with its numerous branches and ramifications, or "Smerdon's Passage," or the "Charcoal Cave" with its branches, or "The Ovens," or the "Crypt of Dates," or the "Tortuous Gallery," or the "Undervault," or the "Swallow Gallery," or the "Rocky Chamber." In short, he has merely seen the more accessible chambers and galleries, and has spent at most no more than three hours even there. His opportunity for personal investigation

"Hath this extent, no more."

He found nothing, never saw a specimen of any kind found, examined nothing, is utterly unacquainted with the geography of the Cavern, never wrote a note or memorandum on the spot of anything he saw; yet he talks of his "personal investigation." It is to be hoped that this is not to be taken as a specimen of nineteenth century scientific research.

We learn, from Quotation I. B., that Mr. Howard's "investigation" was "long" as well as "personal." The word "long" was rather puzzling, as three hours do not make up a very protracted period. It occurred to me at length, however, that his "investigation" consisted partly, perhaps mainly, in *reading* up his case. To show the extent of his *reading* on the question, he gives at the end of his paper a "LIST OF WORKS CONSULTED." The Literature of Kent's Cavern is not so conspicuous in it as it perhaps should have been, for, whilst he could easily have "consulted" the Annual Reports of the Committee appointed by the British Association to explore the Cavern, from No. 1 to No. 14 inclusive, he was content with the first four only. Again, whilst he paid me the compliment of "consulting" my *Notes on Recent Notices of the Geology and Palæontology of Devonshire, Part I.*, he ignored Parts 2 and 3, which contain a considerable amount of matter on the Cavern. I could mention other omissions, but the foregoing must suffice.

Again, in Quotation I. B., the author says, "It has only been by long investigation I have discovered these confirma-

tions of my original impressions;" from which it appears that he allows his impressions on at least some important branches of science to precede his investigations thereon. This method it may be feared is neither new nor satisfactory.

Baron Cuvier's Cautiousness.

Quotation II. : "In 1824 Cuvier exhibited his usual large-minded caution when asked whether human bones had yet been discovered and proved to be co-eval with those of extinct mammalia. '*Pas encore*' was his simple reply.—Nott and Gliddon, *Types of Mankind*, p. 341." Foot-note, p. 2.

Every one acquainted with the literature of Anthropology must be aware of the frequency of the statement that Cuvier did not believe that man was a contemporary of the extinct Cave mammals. I confess that this statement has always appeared to me to be utterly unimportant, for the facts on which the belief of this contemporaneity is based have been discovered, at least mainly, since Cuvier's decease (13th May, 1832). Moreover, the words ascribed to him—" *Pas encore* " = Not yet—are by no means inconsistent with the belief that such discovery might yet be made; nor does it seem improbable that they were the utterance of a mind in the attitude of expectation.

Mr. Howard, it will be seen, places the words "*Pas encore*" in Cuvier's mouth on the authority of Nott and Gliddon, but he fails to tell us who are their sponsors, or whence they obtained the words. This quoting at second hand is most undesirable, it being the duty of every one, aiming at scientific accuracy, to verify quotations.

Cuvier, however, "exhibited his large-minded caution," at least, on one occasion in a direction opposite to that pointed out by Mr. Howard. Writing, in his *Essay on the Theory of the Earth*, on what he supposed to be the great catastrophes which had entombed the extinct mammals, he said, "I do not presume, however, to conclude that man did not exist at all before this epoch. He might then have inhabited some narrow regions, whence he might have repopled the earth after those terrible events. Perhaps also, the places which he inhabited may have been entirely swallowed up in the abyss, and his bones buried at the bottom of the present seas, with the exception of a small number of individuals, which may have continued the species." *Op. cit.*, *Trans.* by Prof. Jameson. 5th ed., 1827, p. 120.

The Evidence of Brixham Cavern.

Quotation III : "The important question . . . which opens upon us is the lapse of time, of which we are supposed to possess a chronometer in the rate of deposit of stalagmite in Kent's Cavern. The Brixham Cavern having been pervaded by a rush of water and the stalagmite thus broken up, affords, as is admitted, 'only a complicated solution of the problem.'" p. 3.

The author refers, at the foot of the page, to "Boyd Dawkins's *Cave-Hunting*, pp. 324-334" for the words he has put within inverted commas—the last seven words of the foregoing quotation. In point of fact, however, the precise words Mr. Howard professedly quotes—"only a complicated solution of the problem"—do not, so far as I have been able to find, occur in the volume named. Mr. Howard is not *very* accurate in quoting, as will be pointed out again and again hereafter. The words to which he probably refers are the following:—"This filling up, re-excavating, and refilling with its present contents, are phenomena which considerably complicate the problems offered not merely by Brixham Cave, but also by those of Kent's Hole." *Cave Hunting*, pp. 323-4. In short Professor Boyd Dawkins writes really of *complicated problems*. Mr. Howard does his best to make him write of *complicated solutions of problems*.

When Mr. Howard says that Brixham "affords, as is admitted, 'only a complicated solution of the problem,'" he, like a true Advocate, makes the utmost of his case. If it have been "*admitted*," and if that be the right word, it has been "*admitted*" by Professor Boyd Dawkins only, so far as I am aware; and it should be stated that the Professor's only visit to Brixham Cavern was a very short one, in November, 1868, when I had the pleasure of accompanying him. The Cavern had been completely emptied of its contents upwards of nine years before that time, so that he had personally no means of forming any opinion on the question.

It is, perhaps, noteworthy that whilst Professor Boyd Dawkins, in the passage just quoted, places Kent's Hole—to which also he has made but one brief visit—in the same category as Brixham Cavern, Mr. Howard ignores this companionship in complicatedness, cuts adrift Brixham Cavern, but sticks tenaciously to Kent's Hole, the phenomena of which he accepts apparently as affording, not a "*complicated*," but a simple "*solution of the problem*."

Stalagmitic Chronometers.

Quotation IV :—"To avoid prolixity in the description of Kent's Cavern, I adopt an authentic estimate in 1874.

"Taking the correct data (that of the report of 1869)* we have twelve feet of stalagmite formed, let it be assumed from the dates on its upper surface, at the rate of .05 inch in 250 years, and thereby arrive at the conclusion, that the accumulation of the whole required 720,000 years.'

"This somewhat long date, examined by Mr. Pengelly's own standard, proves not nearly long enough. He has said (p. 24) that 250 years have failed to precipitate an amount of calcareous matter sufficient to obliterate incisions which at first were probably not more than an eighth of an inch in depth.

"I have recently seen all this under the courteous guidance of this gentleman, and was able to observe specially the inscription in 'the Crypt of Dates' to which he refers. It might seem to have argued too much intrusive curiosity and too little confidence in our guide for me alone, amongst a large party of ladies and gentlemen, to have attempted too near a view; but my belief is that the inscription is not nearly so deep nor the incrustation so great as above indicated. The example proves too much, and in all probability the present proprietor of the Cavern is right when he says (p. 21) that *in thirty-five years there has been no appreciable growth in any of the formations*. In fact the source of supply has from some cause failed almost entirely." pp. 3-4.

The foregoing somewhat lengthy quotation suggests the following topics for remark :—

(a.) The Calculation based on the thickness of the Stalagmite.

(b.) Mr. Howard in the "Crypt of Dates."

(c.) Mr. Howard's lack of intrusive curiosity.

(d.) Mr. Howard's *belief* as to the depth of the inscription and of the incrustation.

(e.) "The present proprietor of the Cavern."

(a.) *The Calculation based on the thickness of the Stalagmite* :—The first paragraph in *Quotation IV.*, is, as Mr. Howard indicates, taken from one of my papers, and, omitting liberties taken with stops and capitals, is correctly

* "*Notes on Recent Notices of the Geology and Palæontology of Devonshire*, Part I. p. 26. By Wm. Pengelly, F.R.S." [Reprinted from *Trans. Devon. Assoc.* vi. 646-685. See, for the passage quoted, p. 670.]

reproduced. Nevertheless, from its severance from its context, it is likely to leave an incorrect impression on the mind of the reader. The facts are as follow: In a review of the 4th edition of Lyell's *Antiquity of Man*, which appeared in *Nature* for 2nd October, 1873, Mr. A. R. Wallace, the reviewer, calculated the amount of time represented by the two Stalagmitic Floors of Kent's Cavern, and came to the conclusion that the more ancient Floor represented about 250,000 years, and the less ancient about 100,000 years, making a total of 350,000 years for the two Floors taken together. As Mr. Wallace's calculation was professedly based on data supplied by the Fifth Report of the Committee for exploring Kent's Cavern (*Rep. Brit. Assoc.* 1869, pp. 189-208), for which I was responsible, I pointed out in the paper from which Mr. Howard does me the honour to quote, 1st, that, judging from stalagmitic accretions on dated inscriptions in the Cavern, the rate of accretion did not exceed $\cdot 05$ inch in 250 years, and did not, as Mr. Wallace assumed, amount to $\cdot 125$ inch in 200 years; and, 2nd, that the greatest known total thickness of the two floors in any one and the same vertical section was 12.5 feet, not, as Mr. Wallace supposed, 17 feet. Then, taking the corrected data, I showed in the passage quoted by Mr. Howard, as given above, that the result would be 720,000 years, not the 350,000 years arrived at by Mr. Wallace. In short, my business was neither to make a calculation, nor to endorse Mr. Wallace's method, but to show that, were the method followed and the calculation made, Mr. Wallace's result must be more than doubled; and, before closing the discussion, I said on the same page (670), "It should be added in justice to myself, that I have always abstained from, and cautioned others against, insisting that the thickness of the stalagmite is a perfectly trustworthy chronometer."

(b.) *Mr. Howard in the "Crypt of Dates:"*—When Mr. Howard said, as quoted above, "I have recently seen all this" [*i.e.* the inscriptions, &c.] "... and was able to observe specially the inscription in the 'Crypt of Dates' to which he" [Mr. Pengelly] "refers," he fell into an error. In my letter to Capt. Petrie (*Sec. Vict. Inst.*) on 1st Feb., 1879, already mentioned, I remarked, "I am sorry that Mr. Howard did not send me his MS., for, though I have not had time to glance at more than a page here and there, I perceive that he has fallen into the error of supposing that he had visited the Crypt of Dates in Kent's Cavern (see p. 4), he having con-

founded that recess with the Cave of Inscriptions, which is in a distant part of the Cavern.

"The Crypt of Dates was discovered on 7th December, 1868. It was always a difficult spot to reach, and in consequence of the excavations, it has become impossible for anyone to get there without a ladder and an amount of risk which few people would care to incur.

"I am safe in stating that, since its discovery in 1868, not so many as a dozen persons have ever entered it, and that Mr. Howard was certainly not one of them. . . . I trust to your sense of justice to give the same publicity to this note as to the paper which has called it forth."

On 20th March I received from the Secretary of the Victoria Institute a Proof of my letter of 1st February, which, having corrected, I returned on 21st, under the impression, of course, that it was to appear with Mr. Howard's paper. On 24th March I purchased in a shop at Torquay, a copy of the *People's Edition* of the paper, and on the 27th, when writing the Secretary of the *Institute* respecting it, said, "I cannot help thinking that after what has passed between us I have a right to complain that my letter is not appended to it" [*i.e.* the *People's Edition*]. On 28th the Secretary, writing me about my letter, said, "The Committee are in this difficulty, that apart from that letter's reference to an inadvertent error (corrected before the day of meeting) in the early proof of Mr. Howard's paper (Mr. Howard having written Crypt of Dates for what he intended to have been Cave of Inscriptions), there is not a single remark in it either actually bearing upon or referring to a single statement in the paper. In my reply on 29th, I said with regard to my letter, "I will ask you to be so good as to see that it is printed in your Journal (as I have been led and allowed to understand that it would be) exactly as I have corrected it. . . .

"Your statement of Mr. Howard 'having written Crypt of Dates for what he intended to have been Cave of Inscriptions,' is one of the most amusing things I have read for a long time. The context is the best comment on that statement."

Though, as stated already, my letter neither appears, nor is any allusion made to it, in the *People's Edition* of Mr. Howard's paper, the following passage has been substituted for that containing the error I pointed out about the Crypt of Dates: "I have recently seen the cave under the courteous guidance of this gentleman, and was able to observe

specially an incision to which he pointed our attention." *Peop. Ed.*, p. 4.

This "incision" was the well-known one, "Robert Hedges of Ireland, February 20, 1688." I do not understand, perhaps Mr. Howard does, what an inscription 190 years old has to do with a stalagmitic rate of accretion of .05 inch in 250 years, of which I was speaking, as Mr. Howard knew very well; I do not detect any connection between a conical boss of stalagmite on which the inscription of 1688 was cut, and the approximately horizontal sheets of the same material having an aggregate thickness of 12 feet, in a distinct and distant part of the Cavern; nor do I understand what Mr. Howard means by saying he "*was able to observe specially an incision.*" The incision I have mentioned was the only one he saw, and the *special observation* he gave it we shall learn presently.

(c.) *Mr. Howard's lack of "intrusive curiosity"*:—"It might seem," says Mr. Howard, "to have argued too much intrusive curiosity and too little confidence in our guide for me alone, amongst a large party of ladies and gentlemen, to have attempted too near a view; but my belief is that the inscription is not nearly so deep" [125 inch] "nor the incrustation so great" [.05 inch] "as above indicated." I perfectly remember that when I directed the attention of the party to the inscription of 1688, and, to enable them to see it, held a small lighted tallow candle near it, Mr. Howard stood in the rear. In fact his eye at the time was at least seven feet from the inscription, whence it must have been utterly impossible to form any opinion as to its original depth or the amount of incrustation. The "large party" of visitors consisted, as already stated, of at most three ladies and as many gentlemen, so that his friend and himself, forming one-third of the total gathering, might, without being chargeable with "too much intrusive curiosity" have requested, and would certainly have secured, as near a view as they wished. As, however, Mr. Howard allowed the opportunity to escape, it is to be regretted for his own sake that he has thought fit to express even a *belief* on points which he confessedly did not study. Science, whose very essence is accuracy, cannot be advanced by gratuitous *beliefs*. I must remark again that the only inscription he saw, being unable to claim an existence of 250 years, has nothing whatever to do with my estimate of the present rate of accretion elsewhere.

(d) *The "present proprietor of the Cavern"* :—"In all probability," says Mr. Howard, "the present proprietor of the Cavern is right when he says (p. 21) that *in thirty-five years there has been no appreciable growth in any of the formations.*" Now, gentle reader, were I to ask you to what "Cavern," and to what "present proprietor" of it you suppose the writer to refer, you would no doubt reply, "the Cavern is, of course, Kent's Cavern, and the present proprietor is, equally of course, Lord Haldon (late Sir L. Palk, Bart., M.P.)" Alas! alas! if this be the result of Mr. Howard's guidance, he must be an untrustworthy guide. "The Cavern" is not Kent's Cavern in Devonshire, but Cheddar Cavern in Somersetshire; and "the present proprietor" is not Lord Haldon, but Mr. J. Streatfield Cox of Cheddar, who, in a letter to me respecting his Cavern, used the words which Mr. Howard has ascribed to "the present proprietor," but without putting them within inverted commas, though he has printed them in italics. The said words were quoted by me in the paper to which Mr. Howard refers, and from which, with a full statement of all the facts before him, he obtained them.

When preparing the *People's Edition* of his paper, Mr. Howard became a little more discreet, for the sentence I have quoted above is abridged into "in all probability *there has been no appreciable growth in any of the formations.*" The "present proprietor," with his "thirty-five years," is dismissed; but his remaining words, too valuable to be lost altogether, are retained.

Before proceeding, I may as well point out that whilst, in the passage now under notice, Mr. Howard copies correctly my estimate of "·05 inches in 250 years," the estimate, when he subsequently refers to it, is multiplied by ten, and appears as "0·5 inch" instead of "·05 inch." (See p. 6.) This error stands uncorrected in the *People's Edition*.

Multiplication of Estimates.

Quotation V : "Mr. Pengelly asserts 'that he has always abstained from, and cautioned others against insisting that the thickness of the stalagmite is a perfectly trustworthy chronometer; nevertheless, it seems fair to ask those who deny that it is of any value to state the basis of their denial.'

"This challenge I shall accept; but in the meantime must ask the reader to note that Mr. Pengelly passes on immediately to say that '*such estimates, if sufficiently multiplied, are of great value.*'" p. 5.

The passages cited from me by Mr. Howard in the foregoing quotation occur, undoubtedly, in my paper referred to previously, and are correctly transcribed. Nevertheless, they do not, as quoted, tell all the truth. The words will be found in that part of the paper (*Trans. Devon. Assoc.*, vi., 670-1) in which, as stated already, I was commenting on Mr. Wallace's review of Lyell's *Antiquity of Man*, and when given in full stand thus: "I have always abstained from, and cautioned others against, insisting that the thickness of the stalagmite is a perfectly trustworthy chronometer; nevertheless, it seems fair to ask those who deny that it is of any value to state the basis of their denial; and I fully concur with Mr. Wallace, that though the estimate arrived at in a solitary case may in itself be loose and untrustworthy, '*such estimates, if sufficiently multiplied, are of great value*,' since they help to form a definite idea of what kind of periods we are dealing with, and furnish us with a series of hypotheses to be corrected or supported by further observation, and will at last enable us to arrive at the antiquity of man within certain possible limits of error." (See *Nature* for 2nd October, 1873, pp. 463-4.)"

It will be seen, therefore, that the words I have italicised above in Quotation V., beginning with "such estimates" and ending with "value," are mine by adoption merely, being part of a paragraph quoted by me, with approval, from Mr. Wallace; that severed from their context they are likely to convey a meaning differing from that intended by either Mr. Wallace or by me; and that the entire paragraph to which they belong not only contains, but it is written on, a recognition of the possible untrustworthiness of stalagmitic chronometers.

When, on reading Mr. Howard's paper, I noted that he had directed special attention to the words I have italicised in Quotation V., on the value of a multiplication of estimates. I looked at them carefully, supposing that they must be capable of disclosing some mental or moral obliquity, and was a good deal comforted on being unable to detect any such disclosure. It must be unnecessary to add that I was amused as well as consoled on finding Mr. Howard—after mentioning, on the authority of M. Reclus, but at second hand, an example of the rapid accumulation of calcareous matter—using the following language: "If we could accumulate a sufficient number of such observations they might, by correcting each other's errors, lead to some useful results." Words which seem to convey much the same idea as was couched in the passage employed by Mr. Wallace, and adopted by me.

Professor W. Boyd Dawkins.

Quotation VI. : " Now it may be conceded that, under some circumstances, the growth of stalagmite may be shown to be so far continuous as presumably to indicate a certain lapse of time. The observations of Mr. Boyd Dawkins* on the rate at which stalagmite is being accumulated in the Ingleborough Cave, are admitted to be of this character. 'The author states, on what appears to be most satisfactory evidence, that the apex of a boss of stalagmite known as the Jockey's Cap, in that cave, rising from the crystalline pavement to a height of 2·50 feet, was found, by careful measurement, on March 13th, 1873, to be eighty-seven inches from the roof; whilst when measured by James Farrar, on October 30th, 1845, it was 95·25 inches from it, so that the upward growth has been 8·25 in 27·37 years, giving an average vertical growth of '3 inches per year.'

" 'On the strength of this fact,' the author remarks, 'that all the stalagmites and stalactites in the Ingleborough Cave may not date further back than the time of Edward III., if the Jockey's Cap be taken as a measure of the rate of deposition. 'It is evident,' he continues, 'from this instance of rapid accumulation that the value of a layer of stalagmite, in fixing the high antiquity of deposit below it, is comparatively little. The layers, for instance, in Kent's Hole, which are generally believed to have demanded a considerable lapse of time, may possibly have been formed at the rate of *a quarter of an inch per annum* !' p. 5."

The ordinary reader would, of course, conclude that the passages cited by Mr. Howard in Quotation VI. were taken from Professor Boyd Dawkins's *Cave-Hunting*, especially as that is the only authority to which he refers. In ordinary cases the reader would, no doubt, be safe in such conclusion, but we have already seen how necessary it is to verify Mr. Howard's quotations, and here we have another proof of this necessity; for, as a matter of fact, all the citations alluded to are taken, but without the least acknowledgment or intimation of the fact, from my paper, mentioned several times already (see *Trans. Devon. Assoc.* vi. 665.) Mr. Howard, in quoting, has thought fit to change my words "Mr. James Farrer" into "James Farrar," and "deposits" into "deposit." Both errors remain uncorrected in the *People's*

* "*Cave-Hunting*, W. Boyd Dawkins, F.R.S., pp. 39, 40, and Appendix II."

Edition of his paper; but notwithstanding these and a few other liberties, the passage as rendered is essentially correct. I have elsewhere dealt with Professor Boyd Dawkins's interesting measurements of the *Jockey Cap*, and can here do no more than refer the reader to my paper just mentioned, to my *Manchester Science Lecture* (17th Dec., 1873), or to my *Glasgow Science Lecture* (24th Jan., 1877, pp. 9, 10.)

Since writing the last sentence I have had the pleasure of reading Professor Boyd Dawkins's *Early Man in Britain* (1880), in which he refers again to his Ingleborough measurements, but with considerably more caution than before, as the following passage will show: "The line of demarcation," he says, "is equally clear in the caverns, in which the late Pleistocene accumulations are generally mapped off from those of the Prehistoric age by a layer of stalagmite, sometimes of considerable thickness. This, however, offers no measure of the interval between the two periods, because the rate of the accumulation depends upon the currents of air in the caves, and the amount of water passing through the limestone, both of which are variables. In the Ingleborough Cave, in Yorkshire, it has been so swift that between 1845 and 1873 a stalagmitic boss, known as the Jockey Cap, has grown at the rate of .2941 inch per annum. In Kent's Hole it has been so slow that an inscription, bearing the date 1688, on a similar boss is only covered by a film not more than one-twentieth of an inch in thickness. It therefore follows that very great thicknesses may be formed in a short time; while, on the other hand, it may take a long series of centuries to form a thin layer of a few inches." p. 264.

I commend this passage to the thoughtful attention of Mr. Howard.

Characteristics of a Chronometer.

Quotation VII.: "We have in the above carefully recorded experiment" [by Professor Boyd Dawkins] "an *approach* to the accuracy of a chronometer in a calculation derived from the increment of real stalagmite; but it will be seen by the specimens which I have had cut and polished (chosen out of a mass of broken-up stalagmite carried by the miners out of Kent's Cavern), that the increase marked by annular rings is by no means uniform. And yet uniformity of action, and the absence of all change in external surroundings, are indispensable to the value of a chronometer." pp. 5, 6.

Though, in the case of a few small "paps" of stalagmite,

"rings" may occasionally be found in the mass of broken-up stalagmite thrown outside the Cavern, "laminæ," not "rings," is probably the correct word; but in any case I fail to see why the expression "annular rings" (= ring-like rings) was used; for, so far as my experience goes, rings are always annular. Did Mr. Howard's pen slip into "annular" when it should have written something else—perhaps "annual"? "Annual" however would have been boldly, perhaps wildly, hypothetical. The word may possibly be a slip on the part of the printer; but if so it should have been corrected in the *People's Edition* of the paper, where it is still "annular."

It is quite true "that the increase marked by" the laminæ "is by no means uniform;" in other words, the laminæ are not of uniform thickness. Nor is it easy to see what we should gain by their being so unless we knew what they each represented. When it is remembered that the thickness of a lamina depends on many causes—on the length of the time during which it was formed; on the quantity of water from which the calcareous matter was precipitated; on the ratio which the mass of water bore to the quantity of carbonic acid it contained; on the pressure to which the water was subjected; on the temperature of the atmosphere within the Cavern in relation to that on the exterior; and on the inclination of the surface on which the accretion occurs—we should probably marvel if we found that the laminæ were of uniform thickness.

Mr. Howard, it is to be feared, will have to wait a very long time before he finds such a chronometer as he insists on. It must have, he says "uniformity of action," and there must be "the absence of all change in external surroundings." It is not worth while to stop my pen for the purpose of remarking that "surroundings" are *usually* "external;" it will be more to the purpose to observe that, tried by Mr. Howard's tests, the great astronomical chronometers must be abandoned; for, according to those most capable of judging, the sun is a bad timekeeper, and the moon still worse. Nevertheless, the sun serves to measure days sufficiently well for all practical purposes; and a chronology based on *lunations* would not carry us very wide of the truth. Indeed, whilst it is known that, thanks to the moon's wretchedly bad measurement of time, the interval between two successive full moons is by no means a constant quantity, the occurrence of the full moon, as calculated from the average length of a lunation, is allowed by the ecclesiastical authorities to regulate the dates of Easter day and of the Moveable Feasts and Holy days of the

Church. The Book of Common Prayer still tells us that "EASTER DAY (on which the rest depend) is always the First Sunday after the Full Moon which happens upon, or next after the Twenty-first day of March, and if the Full Moon happens upon a Sunday, is the Sunday after." The sun and moon, however, neither have "uniformity of action," nor "the absence of all change in external surroundings."

Mr. Howard, in Quotation VII., compliments the Jockey Cap of Ingleborough Cave by speaking of the "calculation derived from" its "increment" as "an *approach* to the accuracy of a chronometer." Is he sure that in it "the increase marked by annular rings" is "uniform"? Has he any reason for supposing that there has been in it even a somewhat near approach to "uniformity of action, and the absence of all change in external surroundings"? He has had no specimens of the Cap "cut and polished." When I had the pleasure of visiting Ingleborough Cave in 1876, after carefully studying the Jockey Cap, I was unable to detect any character in which it differed essentially from the inscribed bosses of Kent's Cavern. As to "the absence of all change in external surroundings," there are on Ingleborough, as in all other parts of Britain, such important changes, to go no further, as wet seasons and dry seasons; and I *know* that in some other respects, such as currents of air and consequent evaporation, Ingleborough Cave is subject to "change in external surroundings" from which almost the whole of Kent's Hole is entirely exempt.

Two superimposed Layers of Stalagmite:—

Quotation VIII.: "It is to be noted that there is nowhere to be found in all the Cavern two layers superimposed, twelve feet in thickness, of *homogeneous and uniform stalagmite*. The chronometer is *absent*." p. 6.

The reader may not unnaturally say here, "This is the first mention Mr. Howard has made of two layers of stalagmite superimposed. What does he mean? Why has he so abruptly introduced the two layers?" I can only say in reply, gentle reader, that Mr. Howard appears to presuppose that you have read my paper, so often referred to, and which seems to haunt him. I have already stated that in that paper I commented on a review, by Mr. Wallace, of Sir C. Lyell's *Antiquity of Man*. When doing so, it was needful to correct an error into which the reviewer had fallen, and I wrote the following passage:—"The two stalagmites lie one immediately

on the other, without any Cave-earth between them, in the Crypt of Dates, and the total thickness of the two taken together is about 12·5 feet." (*Trans. Devon. Assoc.* vi. 670.) This passage, I opine, was before Mr. Howard's eye when he wrote the words forming Quotation VIII.

I am not at all sure, however, that I understand what is his precise meaning in the passage. The following three possible meanings present themselves:—

(a.) That there was never found a case in the Cavern of "two layers superimposed, twelve feet in thickness."

(b.) That, whatever there may have been formerly, there was no such case remaining at the date of his last visit.

(c.) That, though there may have been two layers, superimposed, and having the asserted thickness, their laminæ were neither homogeneous in structure, nor uniform in thickness.

But whatever he may really mean, his statement is such a display of rashness that nothing short of a considerable knowledge of human nature could enable one to believe that it could have been written by a gentleman whose lack of "intrusive curiosity," or shyness, "amongst a large party" [*i.e.* six] "of ladies and gentlemen," deprived him of a near view of an inscription when visiting the Cavern with the intention, it may be presumed, to collect materials for his paper.

How can Mr. Howard pretend to say what may have been found in the Cavern? From 28th March, 1865, when the Committee began their exploration—up to 11th June, 1878—when he made his last visit, upwards of 13 years, during which the work had been carried on continuously from day to day—the workmen had destroyed vast sheets and bosses of stalagmite, broken them into small pieces, and taken them out of the Cavern; and about their character Mr. Howard is necessarily and utterly ignorant.

Again, as stated already, there are numerous and considerable branches of the Cavern which Mr. Howard has never seen. Whether they did or did not, do or do not, contain stalagmite, what were the character and thickness of any stalagmites found in them—if they contained any—he has no means of knowing except by studying the Reports published annually from 1865 to 1879 inclusive, or by reading the various papers which, in addition, I have printed during the same period.

I can only repeat what I wrote in 1868:—"In the Western Division of the South-West Chamber . . . the thickness of the Stalagmitic Floor surpassed everything previously

met with. Up to this time it has averaged more than 7 feet; in two instances only, and over very limited spaces it was so little as 3 feet; and it has reached as much as $12\frac{1}{2}$ feet." (*Rep. Brit. Assoc.*, 1868, p. 54.) I may add that the Crypt of Dates was vertically over the western division of the South-west Chamber, the floor of the Crypt being the ceiling of the Chamber. About the character, as well as the thickness of these particular stalagmites Mr. Howard can know nothing whatever from personal investigation, for in 1868-9 the workmen, burrowing under them, blasted off many feet in thickness of their entire base. (*Ibid.*, 1869, p. 194.)

I had the pleasure, however, of directing the attention of Mr. Howard and his friend, on 11th June, 1878, to "the Inscribed Boss of Stalagmite," and I take this opportunity of reproducing a description of it which I wrote in 1874:—"The Boss, which may be described as a frustrum of an oblique cone, measures 43 feet in basal circumference and 14 feet along the slant side, which, forming an angle of 70° with the horizon, gives a vertical height of fully 13 feet. The cubic contents are probably not less than 630 cubic feet of Stalagmite. Its base consists of the Older, or Crystalline Stalagmite, and the upper portion (without any intervening Cave-earth) of the Granular variety, which not only surmounted and completely encased the former, but, by flowing in vast sheets, formed the thick Granular Floor spreading far and without a break in every direction." (*Ibid.*, 1874, pp. 9, 10.) I told Mr. Howard, what had there been a ladder at hand, he could have seen for himself, that on this Boss there were numerous inscriptions. One of these is dated 1615, another 1617, and a third 1626. He saw, as he might still see, that the Boss stood on the Breccia—the oldest of the Cavern deposits, so far as is known; and I told him that, almost adjacent to the Boss, a fine chert implement had been found at the depth of 4 feet in that Breccia. (*Ibid.* p. 15.)

Stalagmite on the "Black Mould."

Quotation IX.: "The first and uppermost stratum met with was a band of black mould, over which no stalagmite had formed, the source of supply having apparently been exhausted. The clock had stopped for an interval estimated by Mr. Pengelly at 2,000 years." p. 6.

It may be well, before commenting on Quotation IX., to

give a brief statement of the deposits found in the Cavern, compiled from my Tract on *The Ancient Cave-Men of Devonshire* (Chambers, 1872), which appears in Mr. Howard's *List of Works Consulted*. The order will be that of beginning with the most Modern, and proceeding thence to the most Ancient known :

1st, or Uppermost. Blocks of limestone, which had fallen from the roof, and weighed from a few pounds to upwards of one hundred tons each.

2nd. Beneath and between these blocks, a *Black Mould*, varying from three to twelve inches in depth.

3rd. A Stalagmitic Floor of laminated and granular texture, and termed the *Granular Stalagmite*.

4th. A *Black Band* composed mainly of small fragments of charred wood, and commonly about four inches thick. This was a local deposit.

5th. *Cave-earth*, consisting of light red ochreous loam, containing about fifty per cent. of small angular fragments of limestone.

6th. A Stalagmitic Floor, eminently crystalline, and termed the *Crystalline Stalagmite*.

7th, or Lowest known. *Breccia*, consisting of dark-red sandy paste, mixed with angular, sub-angular, and rounded pieces of grit.

In order to enable the reader to form an opinion respecting the value of Mr. Howard's statement, to the effect that no stalagmite had formed over the Black Mould, it will be simply necessary to make sundry quotations from the Annual Reports of the Committee charged with the Exploration of the Cavern :

In the First Report the following passages occur in a description of the contents of what is called the "Great Chamber :

"The following is the succession of deposits in descending order

"1st. Huge blocks of limestone which had manifestly fallen from the roof. In some cases two or three of them lay one on another, and, in a few instances, were firmly cemented together by a separate cake of stalagmite between each pair ; whilst others lay unconformably, with considerable interspaces. Occasionally, what appeared to be a boss or dome of stalagmite proved to be a block, or two or three small blocks, of limestone invested on all sides with a stalagmitic sheet

"Beneath these limestone blocks there was a layer of

mould of an almost black colour. It varied from a few inches to upwards of a foot in depth" [and was termed the *Black Mould*]. (*Rep. Brit. Assoc.*, 1865, p. 18.)

Again ; The following statement occurs in the Third Report, after a description of objects found in the Black Mould :— "In the south-eastern portion of the Great Chamber, where the overlying Black Mould was itself overlaid by a cake of stalagmite, which was attached to the wall of the Cavern, from 1 to 2 inches thick, and which measured 7 feet from north to south by 6 from east to west. In many instances, stalagmite, fully as thick, had been found on the large blocks of limestone lying on the Black Mould ; but this was the first, and, indeed, is at present the only, example of such a cake formed immediately on the Black deposit itself." (*Ibid.*, 1867, p. 28.)

It is obvious, therefore, that Mr. Howard's statements that no stalagmite had formed over the Black Mould, and that "the [stalagmitic] clock had stopped for an interval estimated by Mr. Pengelly at 2,000 years," must be taken with a grain of salt. It may be added that he had read, or ought to have read, both the foregoing passages, since the First and Third Reports, whence they are cited, are in his *List of Works Consulted*. Moreover, a portion of the "cake of stalagmite," with the Black Mould beneath it, mentioned in the citation from the Third Report, was not only left intact by the Committee expressly and solely for the inspection of visitors, but on 11th June, 1878, I took the entire party of six, of which Mr. Howard was one, and directed their attention to this very relic. Indeed, I have no recollection of having in a single instance omitted to call the attention of visitors to this choice morsel. It is possible, however, that Mr. Howard's curiosity was not sufficiently intrusive for him to attempt a near view. Be this as it may, the guide will be able to show him when next he visits the Cavern that the clock, instead of having stopped, is still constantly going at and near the relic just mentioned.

Mr. Howard is perfectly correct when he speaks of "an interval estimated by Mr. Pengelly at 2,000 years," as is shown by the following passage from my second *Glasgow Science Lecture* (January, 1877). Speaking of the objects found in the Black Mould, I said, "They mainly and essentially, however, belong to the Romano-British and pre-Roman portions of British history. This uppermost bed, then, takes us back at least 2,000 years as a minimum, and it is difficult to prove that it does not take us back much

further." p. 8. (See also *The Ancient Cave Men of Devonshire*. Chambers, 1872, p. 13; or my *Manchester Science Lecture*, December, 1873.)

Stalagmite versus Magma.

Quotation X. A. "If we are to judge by what is left, it" [the *Granular Stalagmite*] "could not properly be called stalagmite at all. It differs wholly in appearance from the true stalagmite, as I noticed in one place where the latter had formed upon the surface of the former." [*sic.*] "It is more properly a *magma* (or tufa, as Mc Enery calls it) into which a stick may be thrust to a considerable depth. . . . a mass of so uncertain origin which . . . need not to have been produced as stalagmite at all cannot be reckoned upon in any sense as a chronometer of time." pp. 6, 7.

B. "Mr. Mc Enery very appropriately observes that in some parts of the cavern the stalagmite and stalactite had been formed by the percolation of water 'through the rents or pores of the rock' . . . in other parts 'the calcareous moisture entered laterally through the clefts and crevices, and spread slowly over the floor.' *Literature of Kent's Cavern*, pp. 41, 42." [*Trans. Devon. Assoc.* iii. 229-230.] Foot-note, p. 7.

C. "Mr. Mc Enery says in other places the drop from the roof acted *concurrently* with the *oozings from the sides* in forming the floor, which consequently partakes of both manners. *Lit. of Cave*, p. 42." [*Ibid.* iii. 230.] Foot-note, p. 7.

It may be well before commenting on the foregoing quotation to devote a few words to the three technical terms—*Magma*, *Stalactite*, and *Tufa*—which occur in it.

MAGMA,—new, I believe, to geological terminology—is defined by Ainsworth (*Eng. and Lat. Dict.*) as (1) "the dregs of an unguent; (2) The refuse or dross of a thing;" whilst Webster says it is "Any crude mixture of mineral or organic matter, in the state of a thin paste."

The other two words are thus defined by Page (*Hand-book of Geological Terms*):

STALAGMITE, (Gr. *stalagma*, a drop). The same mineral as *stalactite*, but applied to the incrustation that covers the floor of the cavern."

"CALC-TUFF or CALCAREOUS TUFF. A porous or vesicular carbonate of lime, generally deposited near the sources and along the courses of calcareous springs, incrusting and binding together moss, twigs, shells, and other objects that lie in the way."

If the word Stalagmite is to be strictly confined to the meaning its etymology justifies, it must be admitted that it may have been applied to calcareous precipitates in Kent's Cavern which may have no literary claim to it. Indeed, it would be marvellous if the mouth of every duct were so situated that the calcareous water it conveyed invariably *dropped* from the roof, and in no instance stole down, or oozed through, the walls; but when, as stated by Mr. Mac Enery (Quotation X. C., where Mr. Howard forgot the inverted commas), "the drop from the roof acted concurrently with the oozings from the sides in forming the floor," it would be difficult or, more correctly, impossible to draw a line of demarcation between them; and were it otherwise it would be very inconvenient, if not impracticable, to be compelled to use distinct names for things which differ, not in their chemical composition, nor, indeed, essentially, but simply in the accident of not entering the cavern in precisely the same manner. Moreover, Mr. Page's definition, quoted above, justifies the general application of the term Stalagmite to the entire calcareous sheets which covered the mechanical deposits of Kent's Cavern.

Be this as it may, I am certain that there are literal Stalagmites in the Cavern, having in parts the structure which Mr. Howard would call Magma, and the only clear example known to me there of a mass which in all probability did not originate in *dropping* water is remarkably and uniformly compact and crystalline. But waiving all this, though the so-called Stalagmites in Kent's Cavern differ a good deal in texture, I deny that there is a single example of Magma as defined above; and I assert that if Mr. Howard made any attempt to experiment with his stick, he must have watchfully selected a convenient opportunity, and kept it a secret, as such an attempt, if known in time, would have been certainly prohibited by the conductor of the party.

Mr. Howard says (Quotation X. A.) the mass which he calls Magma "cannot be reckoned upon in any sense as a chronometer of time." I cannot stop to ask whether there are *chronometers* of other things as well as "of time," but I *must* ask whether Mr. Howard is aware of anyone who has ever "reckoned upon" any such mass as he speaks of as a chronometer? He knows perfectly well that the calculations which appear to disquiet him so much are based on inscriptions in various parts of the Cavern. To talk of a Magma in this connection is manifestly beside the mark, inasmuch as all the inscriptions are necessarily on masses of a firm, coherent

and compact texture, on which alone they are capable of being made. They are almost the whole of them on bosses rising above the general sheet of the same material, and proclaiming by that fact that they originated from *dropping* water, and are truly, strictly, and literally Stalagmites. (For inscribed bosses mentioned in the Annual Reports of the Exploring Committee, see *Reps. Brit. Assoc.*, 1873, p. 202; 1874, p. 10; 1875, p. 7; 1876, p. 6; and 1877, p. 2.)

One hundred thousand years.

Quotation XI., A: "So much for the upper stalagmite floor, which was from sixteen to twenty inches thick, sometimes attaining five feet, and containing large fragments of limestone, a human jaw, and the remains of extinct animals." p. 7.

B. "In *Notes on Recent Notices of the Geology and Palæontology of Devonshire*, Part i. p. 37, read at Teignmouth, July, 1874, I find that 'the human jaw was near the base of the stalagmite.' This was 20 inches in thickness, and reckoning '500 years for each inch of the stalagmites,' we verge upon 100,000 years for the era of this human being." Foot-note p. 7.

C. "According to Mr. Pengelly some hundred thousand years at least before Adam sinned (as Jews and as Christians believe), man was associated with a creature possessing the formidable weapons of offence characteristic of the sabre-toothed bear." p. 10.

The *Notes on Recent Notices, &c.*, quoted professedly by Mr. Howard (Quotation XI., B.), was written by me. Indeed, it is the very paper which he has so frequently cited in earlier pages of his *Caves of South Devon*; but neither on page 37, to which he refers, nor elsewhere, is there in it any mention of, or allusion to, the "human jaw." It is probable, however, that he meant to refer to my *Ancient Cave Men of Devonshire* (Chambers, 1872), for there, in an enumeration of the objects found in the Granular Stalagmite, the following words occur: "A portion of human upper jaw containing four teeth, with a loose tooth lying near it. . . . The human jaw was near its base, where it was twenty inches in thickness." (*Op. cit.*, pp. 9, 10.) It will be seen, therefore, that though the exact words Mr. Howard puts, as mine, within inverted commas, do not occur in the passage, the words he professes to quote are substantially the same, though not where he says they are.

When, however, he goes on to add, "and reckoning '500 years for each inch of the stalagmites,' we verge upon 100,000 years for the era of this human being," he professes to quote, as the inverted commas show; and he makes a calculation.

The words "500 years for each inch of the stalagmites," he probably supposes he quotes from me; and, in fact, words very much like them do occur in my *Notes on Recent Notices*, &c., in which he professedly found the words about the human jaw, already disposed of. The facts are as follow: The Rev. A. G. L'Estrange, in his *From the Thames to the Tamar*, describing a visit to Kent's Cavern, said "Our guide, who was one of the workers, told us that each inch of the formation represented 10,000 years." In commenting on this estimate, I speak of it as greatly exceeding anything that had reached me from any other quarter; and I then go on to say, "For myself, I am content with the modest hypothesis of 5,000 years for each inch of the stalagmites" (*Trans. Devon. Assoc.* vi. 682.) These, I opine, are the words Mr. Howard had in his eye; but instead of "5,000," he wrote "500," and so it remains in the *People's Edition* of his paper.

With the foregoing data he makes a calculation of this kind: The Stalagmite was twenty inches thick, and was formed, he says, at the rate of 500 years per inch; and concludes thence, but not according to Cocker, that "we verge upon 100,000 years" for the whole. If, however, his data be correct, he means 10,000 years, not 100,000. Having done his sum, he endeavours to fasten the result upon me, and actually seems to rollick in it, for he returns to the subject, saying "100,000 according to Mr. Pengelly, or 200,000 according to the guide." Foot-note, p. 8.

In Quotation XI., C., Mr. Howard cuts me off from Jews as well as from Christians, and that too by a process of insinuation. He knows perfectly well that estimates of the chronological value of the Stalagmites are based exclusively on the inscriptions found on some of them; he has read, indeed he quotes, my statement that I have "always abstained from, and cautioned others against, insisting that the thickness of the stalagmite is a perfectly trustworthy chronometer" (*Trans. Devon. Assoc.* vi. 670); and he has also read my words "It is unsafe to use the rate at which stalagmite accumulates in one branch of a cavern to measure the time represented by the stalagmites in any other branch of the same cavern." (*Ibid.* p. 666.) He is at no pains to ascertain whether there are any dates on, or connected with, the Stalagmite in which the portion of human jaw was found; but he takes a state-

ment of less than two lines from one of my papers written in 1872; this he professes to quote from another of my papers written in 1874, where there is neither mention of, nor allusion to, the subject; next he goes to the paper of 1874, whence he quotes, but incorrectly, eight words; then he makes a calculation with the data obtained from the two citations, but, not being a Bidder, does his sum badly; the result thus arrived at he applies to a *sheet*, not a *boss*, of stalagmite, in a large division of the Cavern where there is not a single inscription; and then endeavours to make me out the father of his unsatisfactory brat. The reader will form his own opinion of Mr. Howard's method. In their Twelfth Report, the Committee, describing the exploration of the portion of the Cavern known as "The Labyrinth," said "It was necessary to break up all the bosses of stalagmite with the exception of the largest of them, of which a portion has been left intact, it being believed that it shows strikingly the utter inadequacy of the data derived from a *boss* to solve the problem of the amount of time represented by a *floor*, and *vice versa*." (*Rep. Brit. Assoc.*, 1876, p. 5.) I directed the attention of Mr. Howard, in 1878, to the remnant of this boss, as well as to its significance in the question of the chronology of stalagmites alluded to in the passage just quoted.

Moreover, in my Second *Science Lecture* at Glasgow (*Antiquity of the Cave Men*, 1877), named in Mr. Howard's *List of Works Consulted*, attention is prominently directed "to the necessity for great caution when attempting to calculate the time represented by stalagmites;" the point insisted on there is the distinction between the teaching of *sheets* and the teaching of *bosses*; and this distinction is illustrated with diagrams and hypothetical calculations. (See pp. 11-13.)

Machairodus latidens.

Quotation XII. A.: "We desire information respecting one animal, the *Machairodus latidens* (Owen), a large lion-like animal, armed with double-edged teeth, in shape like the blade of a sabre and with two serrated edges. This formidable creature seems to belong rather to the *pleiocene* than to the *pleistocene* age, and its remains are exceedingly rare, but were found by Mc Enery in the cave, giving rise to considerable controversy.

"It is probable that the expenditure of some thousand pounds by the British Association" [in exploring the Cavern] "has produced no results so important as the confirmation of

the accuracy of the previous discoveries of Mc Enery, this one among the rest." p. 8.

B. "According to Mr. Pengelly . . . *some hundred thousand years* at least before Adam sinned . . . man was associated with a creature possessing the formidable weapons of offence characteristic of the sabre-toothed bear." p. 10.

C. "It is quite possible that not only the teeth of the *Ursus cultridens* found by the committee, but many other things, have got out of place in the *mells*." p. 14.

D. "It seems clearly proven that some of the deepest recesses were quietly tenanted by large bears of three or four distinct species, one of which was the sabre-toothed variety before alluded to—a bear with the teeth of a tiger. These held undisputed sway in what may be called the aristocratic portion of the cavern, whilst at the same time, as it would seem, the rest was held possession of by troops of hyænas." p. 19.

It seems necessary to inform Mr. Howard that his "*Machairodus latidens* (Owen), a large lion-like animal" (Quot. XII. A.), "his sabre-toothed bear" (Quot. XII. B.), his "*Ursus cultridens*" (Quot. XII. C.), and his "bear with the teeth of a tiger" (Quot. XII. D.), are really nothing more than one and the same extinct species of mammal; that no palæontologist thinks now of referring its remains, found in Kent's Cavern, to the genus *Ursus*, or to the species *cultridens*; that when spoken of scientifically it should always be called *Machairodus latidens*, whilst in popular phraseology the phrase "large lion-like animal," which he has adopted from Prof. Boyd Dawkins (*Cave Hunting*, 1874, p. 330), is perfectly allowable; and that the species must not be confounded with *M. cultridens*. Some information respecting the genus may be found in the *Quarterly Journal of Science* for April, 1873, iii., 204–223.

Mr. Howard, who learnt from Mr. Boyd Dawkins in 1874 that *Mach. latidens* "seems to belong rather to the *pleiocene* than to the *pleistocene* age" (see *Cave Hunting*, pp. 330–335), ought also to have learnt from the same author in 1877 that he had himself found a tooth of this very species in a Derbyshire cavern, and that "in association with it were a fine flint flake, and remains of Bear, Woolly Rhinoceros, Reindeer, Horse, and Mammoth" (*Quart. Journ. Geol. Soc. Lond.*, 1877, xxxiii., 594); that, in short, there was no longer any necessity for anyone to believe—what no one really acquainted with the facts of Kent's Cavern ever did or could believe

—that the teeth of *M. latidens* had got out of place in any *melle*.

When Mr. Howard speaks of “the teeth of the *Ursus cultridens*”—[correctly *Mach. latidens*—“found by the Committee” [Quotation XII. C.], he makes a little slip, which, however, can be easily corrected by reading “tooth” for “teeth,” the Committee having really found no more than one incisor tooth of the species.

The amusing hypothesis that the Bears dwelt in one, and that an aristocratic, portion of the Cavern, from which, at least, all other genera were excluded, whilst troops of Hyænas held possession of the other parts, originated with Mr. Mac Enery. (See *Trans. Devon. Assoc.* iii. 239, 256, 313, 455.) I have had occasion more than once to point out its incorrectness (*Ibid* vi. 681; xi. 547), and now return to it merely to correct Mr. Howard’s statement that the relics of *Machairodus latidens*, to which he gives the designation of “a bear with the teeth of a tiger” were found in “the deepest recesses,” in other words, in the “Bears’ Den” of Mac Enery.

The only remains of the species found in the Cavern, so far as is known, were teeth—five canines and one incisor, by Mac Enery, in January, 1826; and one incisor, by the Cavern Committee, on 29th July, 1872. That Mac Enery’s specimens were met with neither in the Bears’ Den, nor in exclusive association with remains of Bear, is clear from his express statements. When describing the Bears’ Den, he says, “It is worthy of remark that the remains of *Ursus Cultridens*” [= *Mach. latidens*] “do not appear here no more than among the Bears in the German Caves, though it does, as we shall see, in the other Chambers with Elephanta.” (*Ibid* iii. 240.)

Again, “It is curious that in that district of the cave” [the Bear’s Den] “which was usurped by the species just enumerated” [Bear] “as its exclusive Den, it” [*M. latidens*] “has not discovered itself.” (*Ibid*, 369.)

Further, his “Plate F.,” devoted exclusively to the teeth of *Machairodus*, contains the following label:—“Found in the Cave of Kent’s Hole, near Torquay, Devon, by the Revd. Mr. Mc Enery, Jany., 1826, in diluvial Mud, mix’d with Teeth and gnaw’d Bones of Rhinoceros, Elephant, Horse, Ox, Elk, and Deer, with Teeth and Bones of Hyænas, Bears, Wolves, Foxes, &c.”

Finally, Mr. Mac Enery, in, at least two instances, speaks of the teeth in question having been found in the Wolf’s Cave (*Ibid*, 243, 294)—a gallery within a very short distance

of one of the eastern entrances, that is as far as possible—within the Cavern—from the Bear's Den.

The Cavern Committee found their specimen in a chamber adjoining the Wolf's Cave, in the Cave-earth; its associations being those named by Mac Enery in his "Plate F."

Flint Implements in the Black Band.

Quotation XIII.: "A local deposit called '*the black band*' . . . yielded 350 flint implements and flakes." p. 8.

Mr. Howard has some sort of justification for writing "350;" nevertheless, the number is not quite accurate. His statement was clearly derived from my *Ancient Cave-Men of Devonshire* (Chambers, 1872, p. 20), where the words used are "upwards of three hundred and fifty flint implements and flakes." Mr. Howard has suppressed the first two words. The exact number was 366 (See *Rep. Brit. Assoc.* 1867, p. 29; my *Manchester Science Lecture*, Dec., 1873, or my *Glasgow Science Lecture*, 1875, p. 18.)

The Entrances to Kent's Cavern.

Quotation XIV. A: "When I first visited the place in 1869 . . . it was supposed that there were only two entrances to Kent's Hole on the eastern side of the cavern hill, fifty-four feet apart, and nearly on the same level, about two hundred feet from the level of mean tide, and from sixty to seventy feet above the bottom of the adjacent valley in the same vertical plane. . . . But it seems now uncertain whether these are the only two entrances, as in about the furthest point to which the excavations have been extended Mr. Pengelly pointed out to us, from the deflection of the flame of a candle, that a current of air was entering from some yet unexplored communication with the surface." p. 9.

B. "But it seems probable, according to Mc Enery, that the ancient apertures were not confined to the actual inlets. It has been already remarked that the sewer-like passages which traverse the body of the deposit, as well as the sally-ports, *appear to have once opened in the sides (a strong current of air circulates through them)*, though we have not yet succeeded in discovering their exits, owing to the accumulation of rubble, or their being masked by the growth of copsewood." Foot Note, p. 9.

C. "I do not believe that the two entrances on the east

side of the hill have been the only entrances. The First Report of the committee informs us that there were formerly *four or five* entrances to the cavern, of which two only were generally known; the others being merely narrow apertures or slits, through which, until they were blocked up from within, the inmates were wont to enter clandestinely." p. 13.

It may, no doubt, be assumed that Mr. Howard's description of the two entrances to the Cavern (Quotation XIV., A.) was compiled from the following passage in my *Ancient Cave-Men of Devonshire* (Chambers, 1872, p. 7): "Kent's Hole has two entrances in the face of the same vertical cliff, on the eastern side of the cavern hill. They are 54 feet apart, and nearly on the same level. They are about 200 feet above the level of mean tide, and from 60 to 70 feet above the bottom of the adjacent valley, in the same vertical plane."

If this assumption be correct, it would have been no more than simple honesty, as well as courtesy, to have stated whence the information was obtained. It will be seen that there was nothing in the original passage to justify Mr. Howard's assertion that in 1869 "it was supposed that there were only two entrances to Kent's Hole;" but if the subject proved resistless, he might have said that one of the points the explorers hoped to settle was whether, as had been surmised by some, there were more than the two entrances.

When he goes on to say, in 1878, "it seems now uncertain whether these are the only two entrances" (Quot. XIV. A.), he shows that he had by no means made himself acquainted with the entire literature of the subject. When his paper was written, the Committee charged with the Exploration of the Cavern had published their Fourteenth Annual Report, but Mr. Howard, according to his *List of Works Consulted*, had seen no more than the first four. Had he read the Sixth Report he would have found the branch of the Cavern termed the "North Sally Port" spoken of as "terminating in an external opening in the eastern slope of the hill, in the same vertical plane as the well and long known Arched or Southern Entrance of the Cavern, but about 18 feet below it, and 10 feet further eastward." (*Rep. Brit. Assoc.*, 1870, p. 18. See also p. 25.) Again, the Seventh Report would have shown him that at the beginning of 1871 two additional entrances had been discovered, making a total of five; that they were all on the eastern side of the hill; but that the three new ones, all connected with the North Sally Port, were from 18 to 20 feet below the level of the two known appa-

rently from time immemorial. (See *Rep. Brit. Assoc.*, 1871, p. 7.)

I remember perfectly mentioning to Mr. Howard and his friend that the workmen had observed that the flame of their candle was deflected at times, so as to show the existence of a current of air, and that the fact was in harmony with the hypothesis that, in their excavations, they were approaching an aperture previously unknown. Long before that, however, careful thermometric experiments had shown me that the mere presence of a single person, with but one candle, was quite sufficient to produce thermal changes sufficient to account for the observed deflection.

The hypothesis of there being one or more entrances somewhere in the direction towards which Mr. Howard saw the men digging their way in 1878, had been forced on me by the Cavern phenomena before his first visit in 1869; I had also been led to believe that they had been choked up before the introduction of the Cave-earth, and had never been reopened. Of this belief, as well as of the evidence on which it rested, Mr. Howard would have been well aware had he read the Committee's Twelfth Annual Report (see *Rep. Brit. Assoc.*, 1873, p. 209); and he can now, if he wish it, learn from their Fifteenth Report that it is no longer a *belief* resting on reasonable evidence, but an ascertained *fact* that at the part of the Cavern most remote from the two entrances now in daily use, there are two entrances, which, however, are completely closed, as, indeed, they have been ever since the end of the era of the Breccia—the oldest known deposit the Cavern contains. (See *Rep. Brit. Assoc.*, 1879, p. 145.)

It is now known, therefore, that the Cavern has seven distinct entrances, of which two only are now open.

With the exception of the words "according to Mc Enery," the entire Quotation XIV., B. is a verbatim extract from Mr. Mac Enery—the italics not being in the original. We look in vain, however, for inverted commas, as well as for any reference to enable the reader to verify the quotation. It will be found in *Trans. Devon. Assoc.* iii. 259.

Mr. Mac Enery misinterpreted the phenomena of the "sewer-like tunnels" connected with the two branches of the Cavern to which, believing that they led to external entrances, he gave the name of "Sally Ports." The North Sally Port, as stated already, has three external entrances, but they were and are so completely filled and closed with deposits that a current of air entering through them is entirely out of the question. As regards the South Sally Port, the Committee,

having spent six months in completely exploring it, said in their Sixth Annual Report, "There is not the least indication that it leads to an external opening, or that any animals ever found or formed a passage into it from the exterior. Indeed, its direction is not such as to take it to the hill side." (*Rep. Brit. Assoc.*, 1870, p. 17.)

Mr. Howard, in Quotation XIV. C., reminds one again of an advocate who does not scruple, when it suits his purpose, to suppress an important word or two. He cites a passage from the Committee's First Report, and his mode of doing it will be best seen by printing in parallel columns the original and his version of it:

Original.

"According to tradition, there were formerly four or five entrances to the cavern, of which only two were generally known, the others being merely narrow apertures or slits, through which, until they were blocked up from within, the initiated were wont to enter clandestinely." (*Rep. Brit. Assoc.*, 1865, p. 16.)

Mr. Howard's Copy.

"The First Report of the Committee informs us that there were formerly four or five entrances to the cavern, of which only two were generally known, the others being merely narrow apertures or slits, through which until they were blocked up from within, the inmates [*sic*] were wont to enter clandestinely." p. 13.

The passage was probably cited because Mr. Howard, for a reason which will presently appear, was anxious to lead the reader to believe that there were known, and admitted, to be more than the two entrances long and constantly used; and, to remove all stumbling-blocks, the important but inconvenient initiatory words—"According to tradition"—were suppressed. The facts are as follow: The Committee knew of only two entrances, but, though they were unacquainted with any others they did not *know* that there were no more; they knew also of the tradition spoken of; and in their First Report they recorded it for what it was worth. It was one of the questions they had to keep before them, and they are now able to state that the tradition was baseless—there were no such "narrow apertures or slits."

Mr. Howard has allowed "inmates" to be substituted for "initiated" in the quotation. This may have been a printer's error; but, if so, there could have been but little care bestowed in correcting the Proof, seeing that the word "inmates," which appears also in the *People's Edition*, is germane to nothing. The Cavern was formerly open to all comers, at all times;

but in 1825 a door with lock and key was placed at the northernmost of the two entrances, whilst the other was otherwise closed, and, as was believed, the Cavern was accessible to Mr. Mac Enery and his colleagues only. Specimens, however, known to be from the Cavern, found their way into the hands of dealers, and proved the existence of clandestine action of some kind; and the probability is that the traditionary apertures and slits were unqualified inventions to prevent a suspicion of the truth. The trick is an old one, and said to be popular with smugglers.

Introduction of the Cave-Earth.

Quotation XV. A: "Now I wish to examine how all this mass of cave-earth entered the cavern? It seems to have been concluded 'that at least the great bulk of it was washed in through the two external entrances, *because there is no other channel of ingress.*'" p. 9.

B. "Mc Enery (p. 75) says, 'On a late occasion, the wood which clothed the cliff was partially cleared away; the rock presented bare, bleached, and corroded surfaces. There was no large rent or external chasm observable on its summit. The only visible opening, except the two mouths, is through the cleft, which forms and extends inwardly from the southern mouth.'" Foot-note, p. 4. [See *Trans. Devon. Assoc.* iii. 263.]

C. "'The *physical impossibility* that the enormous mass of loam could have entered exclusively through the present mouths, inclines us to think those canals open in the *concealed mouths* of the former entrances.'—Mc Enery, p. 113." *Ibid.* [See *Trans. Devon. Assoc.* iii. 301.]

D. "'On further examination, I found that the rocky cover of the cavern is perforated with *numerous crevices or windows*, partly choked with mud and brambles, through which, at so many portholes, the mud in a state of fluidity may have entered into the common reservoir of the interior.'—Mc Enery, p. 281." *Ibid.* [See *Trans. Devon. Assoc.* iii. 453.]

As Mr. Howard accepts Mr. Mac Enery's opinion that the mechanical deposits were derived from without the Cavern, and which I have no kind of doubt is perfectly correct, the question of the sources whence they were obtained need not now detain us. The following is my interpretation of the facts disclosed by the exploration: That the Breccia, the oldest deposit in the Cavern, so far as is known, was introduced exclusively through the two recently found western

entrances; (I know, at present, of no reason why it may not be possible that the lodgment of this deposit was, perhaps, effected in a short time, speaking geologically); that, passing by some minor occurrences at the close of the era of the Breccia, the two western entrances were choked up with that deposit, and have remained in that condition to the present day,—the condition, indeed, in which the Committee have still allowed them to remain; that long subsequently—matters very important in themselves, but of no importance in the question before us, having occurred in the interval—the Cave-earth was introduced, in small instalments, unattended with violent or cataclysmal action, and with protracted intermittences, the whole occupying a very long period; and that the two well-known eastern entrances were practically the only inlets by which it entered.

Here, it is needless to say, Mr. Howard comes into contention with me. He, being intent on a short chronology, stipulates for more inlets. Quotation XV. A. contains a few words placed within inverted commas, but without any reference. They are from my *Ancient Cave-Men of Devonshire*, p. 15, the italics being introduced by Mr. Howard. Here again there has been a suppression; the paragraph has not been quoted in its entirety, and the portion excised is important. This can be best shown by placing the original and the dwarfed copy side by side.

Original.

“Minute portions of it” [the Cave-earth] “may, perhaps, have entered through small tortuous flues, which, possibly, traverse the limestone, from the cavern to the surface of the hill; but that, at least, the great bulk of it was washed in through the two external entrances, may be safely concluded, because there is no other channel of ingress, and also because its highest level is at the entrances, whence it declines in all directions.”

Mr. Howard's Copy.

“It seems to have been concluded ‘that at least the great bulk of it’” [the Cave-earth] “‘was washed in through the two external entrances, *because there is no other channel of ingress.*’”

Mr. Howard, it will be seen, suppresses not only my cautious admission that “minute portions of it” [the Cave-earth] “may, perhaps, have entered through small tortuous flues which possibly traverse the limestone,” but also the fact—important

in the present discussion—that “its highest level is at the entrances, whence it declines in all directions.”

The hypothesis that portions of the Cave-earth found ingress through any of the entrances discovered during the exploration is utterly untenable. The two western entrances, being completely choked with true typical Breccia, as stated already, must have been closed before the Cave-earth era began, and may, therefore, be dismissed. The three additional, but low-level, entrances, found on the eastern side of the hill, are from 18 to 20 feet below the level of the upper surface of the Cave-earth in almost the same vertical plane, and may therefore also be ignored. I conclude, in almost the same words as in 1872, that, at least, the great bulk of the Cave-earth was washed in through the two long-known, high-level, eastern entrances, because there were no other available channels of ingress; and also because its highest level is at these entrances, being nowhere higher than the entrances, and declining rapidly from them in all directions.”

It is, perhaps, worthy of remark here, especially as Mr. Howard has great faith in Mr. Mac Enery's statements, that the question of the admission of the Cave-earth was discussed half a century ago, and that in a passage, overlooked apparently by Mr. Howard, Mr. Mac Enery says:

“*Sufficiency of the inlets for the mud.*

“It has been objected that the mouths are insufficient for the admission of such a quantity of mud—but it is not attempted to be shown by the persons who make this objection that it was derived from the cavern. It is admitted that it came from without.

“It should be borne in mind that in their natural state, before the addition of the mould as a guard against the entry of cattle the apertures were wide and broad, and they seem to have been amply large for the inlet of the mud when it is recollected that it entered in a liquid state, and that according as it poured in, it was swallowed up in the gulph within.” (*Trans. Devon. Assoc.* iii. 259.)

The remaining portions of Quotation XV.—viz., B., C., D.—are citations from three distinct portions of Mr. Mac Enery's *Cavern Researches*, but connected by Mr. Howard into one footnote. It is, perhaps, unnecessary to say that Mr. Mac Enery never printed his *Researches*; that his MS. is now the property of the Torquay Natural History Society; and that in 1869 I transcribed the whole and printed it *in extenso*, without any alteration whatever, in the *Transactions of the Devonshire Association* (vol. iii., pp. 203–482). In some

prefatory remarks, I observed of the MS., "It may be said to consist of ten Fasciculi, which I have designated A, B, C, D, E, F, G, H, I, and J. The last consists of a series of Scraps, Notes, and Memoranda. The others take the form of separate Narratives or Essays. . . . They are all in a more or less imperfect condition," &c. (*Op. cit.* 199.) It may be added that not one of them was ready for the press; it cannot be supposed that the writer ever intended to print more than one of them; and that one was without doubt "A"—the first in the series. On comparing a statement in any one of them with a statement on the same topic in any of the others it will often be found that there are material differences, and not unfrequently decided contradictions. In all such cases the statement in Fasciculus A must be preferentially taken.

Mr. Howard's Quotation XV. B., is from Fasciculus B. Whether it helps him much will be seen when quoted fully, and without suppression:

Original.

"On a late occasion the wood which clothed [*sic*] the cliff was partially cleared away, the rock presented bare bleached and corroded surfaces. There was no large rent or external chasm observable in its summit. The only visible opening excepting the two mouths is thro the cleft which forms and extends inwardly from the southern mouth, merely sufficient however to admit the fibres of the shrubs that are seated in the hollow surface of the rock, to insinuate themselves into the interior (where they are found buried in the mud, or firmly embraced between the laminæ of stalagmite)." (*Trans. Devon. Assoc.* iii. 263.)

Mr. Howard's Copy.

"On a late occasion, the wood which clothed the cliff was partially cleared away; the rock presented bare, bleached, and corroded surfaces. There was no large rent or external chasm observable on its summit. The only visible opening, except the two mouths, is through the cleft, which forms and extends inwardly from the southern mouth."

We learn, therefore, from Mr. Mac Enery's words—but not as they are quoted by Mr. Howard—that the "cleft" spoken of was "merely sufficient to admit the fibres of the shrubs . . . to insinuate themselves;" and we cannot but be satisfied

that Mr. Mac Enery did not suppose that they rendered much, if any, aid in the introduction of the Cave-earth.

Before leaving this quotation, I may remark that though Mr. Mac Enery speaks of "the cleft which forms and extends inwardly from the southern mouth," there can be no doubt that for "southern" we should read "northern," where not only the "cleft," but the "fibres of the shrubs" may still be seen.

When, in Quotation XV. C., Mr. Mac Enery speaks of "the physical impossibility that the enormous mass of loam could have entered through the present mouths," I appeal from Fasciculus C., whence the words are taken, to Fasciculus A., where, as shown already, he contends for the "*Sufficiency of the inlets for the mud.*"

Quotation XV. D. is one of the "Scraps, Notes, and Memoranda" which make up the last Fasciculus. Waiving the question, "Has it reference to Kent's Hole?" about which there is no proof or evidence—it is clear from the context that the "further examination" was made on the exterior, and resulted in nothing more than the discovery of depressions in the limestone "partly choked with mud and brambles." Openings from them may have extended through the roof into the interior, and if so, Cave-earth may have entered through them; but there is no proof one way or the other.

I may add that having visited the Cavern almost daily from the commencement of the British Association exploration on the 28th March, 1865, to June, 1880, when these words were written, I have during that period made a careful study of the roof from the interior, in every part of the Cavern, as the workmen advanced. Examples of cavities looking like the lower ends of flues have presented themselves, but most of them have proved to extend upwards into the limestone for short distances only; a very few have left me unconvinced as to whether they did or did not pass through to the surface of the hill; and the result is that, as in 1872, I think it possible, but by no means certain, that minute portions of the Cave-earth may, perhaps, have entered through small tortuous flues, which possibly traverse the limestone, from the Cavern to the surface of the hill. (See *Ancient Cave-Men of Devonshire*, p. 15.)

But what if the Cave-earth entered through a thousand inlets? The important question after all is, Was the total time occupied in its ingress long or short? I reply in the words uttered in 1875, and which Mr. Howard quotes (p. 9):

"The hypothesis that best explains the facts is this—that at the time the Cave-earth was carried into the Cavern it was introduced in very small instalments, or minute quantities at a time, and after some interval a further small quantity, and so on." (*Manchester Science Lectures*, Seventh Series, p. 143); and will add, that the operation must have been usually attended with little or no violent action. The following facts have led me to the opinion just enunciated:—

1. Many of the bones and stoues at every level are invested with thin films of stalagmite, thus showing that the portion of the Cave-earth on which they lay was once the surface of the deposit—the Cavern floor, for the time being; and that the objects lay there unburied and exposed to the lime-laden drip from the roof during a period sufficiently long for the formation of the stalagmitic envelope, after which the process was interrupted, and the objects were buried by the introduction of a further instalment of Cave-earth. That such instalments were usually on a very limited scale, is seen in the fact that the same phenomenon presents itself again and again at every change of level, no matter how small.

2. Coprolites of the Hyæna occur occasionally at different levels in the deposit, adhering to the objects on which they were primarily lodged, and having undergone no change either in volume or in form since they were dropped; thus disclosing, not only a series of successive surfaces, but the gentle character of the inhuming process.

3. Many of the flint implements found in the Cave-earth have keen unbroken edges, soon injured by merely rough handling. It is inconceivable that a large volume of mud and stones rushing impetuously into the Cavern would leave such delicate objects without marks of the violence on them.

4. Huge blocks of limestone which had fallen from the roof are found at all levels in the Cave-earth, as well as in and on the overlying deposits, showing that they fell at various times, and were not the result of any great catastrophe. Bones met with on the Cave-earth immediately beneath any one of these blocks and in contact with it, were invariably found to be crushed, but with their fragments in juxtaposition. Hence, it is clear that the bones must have been lying on what at the time was the Cavern floor, and that the deposit was firm, unyielding, and capable of offering resistance to the falling mass. After the event, there was introduced a further instalment of Cave-earth, forming a new floor for the time being.

Diluvial Action.

Quotation XVI. A.: "I read in the Fourth Report (p. 3)" [*Rep. Brit. Assoc.*, 1868, p. 48]. "'The older floor, of which the masses of old stalagmite are obviously remnants, appears to have been *broken up* by being fractured along planes at right and other high angles to its upper and lower surfaces.' But if so, the remains of man and of animals must surely have been borne along likewise in heterogeneous confusion; and I must confess that, notwithstanding all the explanations of my guide, and statements such as are found in the numerous works on the subject, such was the impression left upon my mind. If the reader will study the above description of these entrances" [the two on the eastern side of the hill, those which alone are now available as entrances], "and much more if he could see the place, he would be satisfied that nothing short of the waters of a deluge could effect this result."

"Mr. Mc Enery, who was not acquainted with the views of modern scientists, calculates from the discovery of a boar's skull accompanied by the head of a badger and an *iron spear*, which were found in the middle of the stalagmite. He says,* 'It is a curious inquiry to ascertain at what historic period the cavern was visited by the boar-hunter armed with his iron spear. Could we arrive at an approximation to that period, by doubling it, we might have the age of the stalagmite. An intermediate period between the deposition of the mud and the present time is strongly indicated, which squares with that assigned by history for the occupation of this country by savage aborigines, who dwelt in native caverns and pits, which they dug underground, before they formed into societies and built themselves abodes on the surface, brought fields into cultivation, and assumed a civilized form.'

"'If we may compute by this scale, taking the charcoal seam as a species of chronometer to measure the time elapsed before and since its deposition, we shall have pretty nearly the time which should elapse since the Deluge; viz., 4,000 or 5,000 years.'" pp. 9, 10.

B.: "At one, two, or more intervals, a powerful current must have swept through the cave, introducing at the earlier period the *breccia* 'of unknown depth,' differing 'from the cave-earth in the darker red of the loam, and the much greater prevalence of *stones* not derivable from the Cavern hill. At a later period, or periods, the same cause must have

* "Mac Enery, p. 73." [or *Trans. Devon. Assoc.* iii. 261-2.]

operated in bringing in the 'cave-earth,' and sweeping before it an accumulation of bones; sometimes, I was told, a *barrow-load together*, and in all unimaginable confusion, not at all like the effect of a tranquil deposit. In addition to this must be noticed the blocks of stalagmite, '*in every branch of the cavern*,' whose structure indicated that they were portions of an old floor, which, in some way not easy of explanation, had been broken up."* pp. 13, 14.

C. "In reference to the probable flow of water through the cavern, I would adduce the following observations of Louis Figuier in his *Primitive Man*, which seem to me well-founded and applicable to Kent's Cavern as well as that of Brixham.

"It is supposed that the bones in question were deposited in these hollows by the rushing in of the currents of *diluvial water* which had drifted them along in their course. A fact which renders this likely is that *drift pebbles* are constantly found in close proximity to the bones. Now these pebbles come from localities at considerable distances from the cavern. There are evident indications that these bones had been carried along by rapid currents of water, which swept away everything in their course, or in other words, *by the current of the waters of the deluge, which signalized the quaternary epoch*."

"It is specially to be noted that '*rolled stones*, not derivable from the cavern-hill, occur here and there in every part† [of Kent's Cavern] which has been explored.' These comprised pieces of granite from Dartmoor, crystalline schist from the Start and Bolt (15 miles off), and even of slate from the more immediate neighbourhood." pp. 15, 16.

D. "Whatever evidence may here exist of the long habitation of hyænas in this cave (and I do not deny its force), there is more cogent evidence of a diluvial current of water having entered the cave, not through the eastern openings (for this is impossible), but having found its way from the land side, and apparently terminated their existence.

"This was the opinion of Mr. Mc Enery, . . . who says in connection with the heading *Diluvium* :

"The floor was surprised by a body of mud which swept up and confounded promiscuously the materials lying upon it, and that this body of mud so covering the bottom of the cavern was *derived from without*, and impelled inwards in a fluid state, and that it was composed of the adventitious transportable materials which it collected in its march; viz.,

* "*Third Report*, p. 6." [or *Rep. Brit. Assoc.*, 1867, p. 29].

† "*Third Report of Committee*, p. 6." [The square bracket, with its contents, following the dagger in the text, is Mr. Howard's.]

sand, clay, and gravel. That there is evidence of only one such irruption, and that there is no evidence of its having been preceded or followed by another." pp. 17, 18.

E. "Besides the dwellers in the cave" [the larger mammals] "which I have mentioned, an innumerable multitude of smaller *rodentia* must have found their subsistence on the remains of the feasts of the gaunt hyenas.

"These, together with the bears and the hyenas, apparently perished together in that irruption of a flood which Mc Enery calls the Diluvium, which left its traces everywhere, and with surprising violence drove the bones and the carcasses together into vast cemeteries, still so fœtid with their remains, that the author of the above description" [Mr. Mac Enery] "nearly lost his life, and certainly impaired his health, in the research." p. 19.

Mr. Howard, as we have seen, is very troublesome in the matter of quotations. In "XVI. A," for example, he cites a passage from the "Fourth Report" (p. 3) of the Committee charged with the exploration of the Cavern, but for the word "they," substitutes the words "the masses of old stalagmite," without in any way indicating that he has done so. It happens that the substitution does no harm, but the habit is slipshod and dangerous.

He takes it for granted that the fracturing of portions of the Floor of Crystalline Stalagmite was due to the waters of a deluge, by which, he says, "the remains of men and animals must surely have been borne along likewise in heterogeneous confusion." I can only say that I never saw an instance of this hypothetical "heterogeneous confusion" during the fifteen years and upwards the work has been under my almost daily superintendence; and that Mr. Mac Enery, as Mr. Howard knows, no doubt, had a very different and, so far as it went, very satisfactory mode of accounting for the fracturing. His hypothesis was that the deposit on which the Stalagmitic Floor was formed subsided, and that the Floor broke through mere consequent failure of support. "The displacement of such an enormous mass," he says, "supposes the existence of still lower gulphs into which it sank from the failure of its support or from the sapping of its foundations by the action of subterranean currents—and its consequent subsidence into the void so created. Appearances seem to favour the former supposition." (*Trans. Devon. Assoc.* iii. 242.)

I have always accepted this hypothesis, not as the cause of

the fracturing, but as a pre-requisite for it. Examples still to be seen in the Cavern show that the unsupported Stalagmite, left to itself, is at least, in some cases strong enough to support much more than its own weight. I have no doubt that the fracturing was caused by the fall of huge blocks of limestone from the roof, from time to time, on the unsupported Stalagmite. (See *Rep. Brit. Assoc.*, 1870, p. 28; and *Trans. Devon. Assoc.* viii. 171, 1876.)

Mr. Howard is of opinion that if the reader will study the description of the Cavern, copied from me without acknowledgment, "and much more if he could see the place, he would be satisfied that nothing short of the waters of a deluge could effect this result." I am not at all sure that I understand to what "result" he alludes; and it is rather provoking not to be told what are the characters of the entrances and of the "place" which would thus satisfy the reader.

There can be no doubt that by a deluge, Mr. Howard means, like Mr. Mac Enery, *the Deluge*. To me it is clear from the sacred narrative, that *the Deluge*, which did not break down, up-root, kill, or silt up the olive tree, would be unlikely to produce geological phenomena recognizable, as such, several thousand years afterwards.

Those, if there be any, who hold that stalagmitic chronometers are perfectly trustworthy, are entitled to ask Mr. Howard in what respect they differ from him, seeing that he expresses his approval of Mr. Mac Enery's calculation, based on the remains "found in the middle of the Stalagmite," and resulting in the seemingly satisfactory conclusion that *the Deluge* occurred about "4,000 or 5,000 years" ago. The very pith of this calculation is the assumption that during the last 4,000 or 5,000 years the thickness of the Stalagmite has increased with practical uniformity. I may add, moreover, from an intimate acquaintance with the "Stalagmite" in which Mac Enery found the objects, that Mr. Howard would have called it a *Magma*, and refused it the name of *Stalagmite*. It is noteworthy that the results of the calculation made by Mr. Mac Enery, and approved by Mr. Howard, are after all not very definite. It might have been feared that "4,000 or 5,000 years," which allows a margin of from 25 to 20 per cent. for error, would have been much too loose for one who contends that "uniformity of action and the absence of all change in external surroundings are indispensable to the value of a chronometer."

It is to be deplored, however, that Mr. Howard makes a fearful blunder in this very case. He speaks of "a boar's

skull accompanied by the head of a badger, and an iron spear which were found in the middle of the stalagmite." He has no authority whatever for saying that the iron spear was found there. The "find" in the middle of the Stalagmite appears to have greatly interested Mr. Mac Enery, as he mentions it at least four times (see *Trans. Devon. Assoc.* iii. 236, 261, 291, and 335); and being met with in a thin sheet of fragments of charred wood, he sometimes termed the spot where the section of this sheet was displayed, the "charcoal streak." His accounts of the objects he disinterred are rather discrepant, but at most there were small polished pebbles of white flint, shells, two jaws a tusk and phalanges of a boar, the head of badger, bones of rabbits and rats, and cylindrical bones supposed to be those of a deer; but there was no iron spear. The Committee conducting the exploration of the Cavern met with the same "charcoal streak," and watched it with great care whilst the Stalagmite containing it was broken up, but no specimens of any kind were found in it. In the same Stalagmite, however, but vertically below the "streak" they dug out a tooth of deer, a large vertebra, a well worn tooth of hyæna, and a piece of black flint. (See *Rep. Brit. Assoc.*, 1872, p. 45.)

With regard to the iron spear head—for one was really found, but elsewhere—Mr. Mac Enery's first mention of it is as follows: "About half way between the mouths on the right side of the Upper Gallery, beneath a large mass that formed a species of grotto, the roof and floor of which were joined with spar, the space about 3 feet high and 6 square—were found lying together the following articles: An iron spear-head, a tusk and 2 portions of the jaw of a Boar—the Head of a Badger and the phalanges of a Hog—all these objects are incrustated precisely like articles from the Dropping springs of Derbyshire and Germany, from which they can be distinguished only by the reddish tint of the spar. They were not imbedded in the floor, but slightly attached to it by the cement. Some shells similarly encrusted." (*Trans. Devon. Assoc.* iii. 220.)

Again, having spoken of the "charcoal streak," Mr. Mac Enery says, "What then are we to infer from the presence of this seam that cuts the stalagmite in two? That when the crust had attained half its depth it was interrupted by the visits of the savage whose spear was found in a grotto" [in] "the upper gallery along with the remaining corresponding portions of the Boar's skull accompanied by the head of a Badger—one of whose under jaws . . . was found in the

seam—and that after he ceased his visits to the cavern the process of infiltration resumed its work in continuing the stalagmite to its present height." (*Ibid*, 261.)

It is a noteworthy fact that Mac Enery's paragraph containing the calculations quoted by Mr. Howard follows immediately the passage I have this moment cited, and it is difficult to understand how, when he was writing the paragraph containing his mention of the "iron spear," having the passage I last cited under his eyes, he could be ignorant that the spear-head was *not* found in or near the "Charcoal streak," and was *not* imbedded in the Stalagmite. In fact, it was found in a distinct and rather distant part of the Cavern. From the "Charcoal streak" the hypothetical boar-hunter would have to come up the entire length of the "Sloping Chamber," pass through the "Passage of Urns" and the "Great Chamber," in order to place his spear-head in the "grotto" where Mac Enery found it.

Mr. Mac Enery seems to have been in a very speculative vein when he entered on his calculation. Undeterred by the fact that one set of boar's remains was found half way down almost the thickest sheet of Granular Stalagmite found anywhere in the Cavern whilst the other set was lying unburied on the surface in a distant chamber, he boldly makes the two sets belong to one and the same individual animal, he assumes that the owner of the spear was a savage, that the spear was a boar-spear, that the hunter, having left one jaw of his victim in one spot, carried the other elsewhere, placing it with his shaftless spear head in a small grotto. Whether or not this is poetry I will not undertake to say, but it is certainly neither science nor philosophy, as I understand the terms.

Not content with one deluge, Mr. Howard says, "At one, two, or more intervals a powerful current must have swept through the cave" (Quotation XVI. B.); to the first of these deluges he assigns the work of introducing the Breccia; but he is apparently doubtful whether the Cave-earth was the result of one, or more than one, flood. This is unfortunately a violation of the canon laid down emphatically by Mac Enery, and quoted, apparently with approval, by Mr. Howard (Quotation XVI. D.)—"That there is evidence of only one such eruption, and there is no evidence of its having been preceded or followed by another."

In Quotation XVI. C., Mr. Howard calls in the aid of M. Figuier's *Primitive Man*; quoting a passage from him, but without any reference. The reader, however, will find the

original at page 60 of the English edition of Figuier's work (1876), and will also find that, as usual, Mr. Howard has, by omissions, substitutions, and italics, "improved" the passage he professedly quotes. It turns out that M. Figuier is not, in the paragraph cited, describing the phenomena of any particular cavern, but introduces the subject with the remark, "There are, however, in several bone caverns certain peculiarities which demand a special explanation." Moreover, he fails to give any authority for the points embodied in his descriptions, which is the more to be regretted as he does not profess to have undertaken original researches:

Even as a mere compiler Figuier cannot be congratulated on his accuracy, as the following examples, which I have been able to check, are sufficient to show:

M. Figuier's Statement.

"In 1842 the Geological Society of London received a communication from Mr. Godwin Austen, who had found in Kent's Hole various wrought objects, accompanied by animal remains, which must have remained there since the deluge." p. 9.

In 1847, M'Enery found in Kent's Hole, a cavern in England, under a layer of stalagmite, the remains of men and antediluvian animals mingled together." p. 10.

"In 1858, the English geologists, Messrs. Prestwich, Falconer, Pengelly, &c., also found some" [relics of primitive industry] "in the lower strata of the Baumaun cavern in the Hartz." p. 11.

"At the meeting of the British Association at Aberdeen, September the 15th, 1855, Sir C. Lyell declared himself to be in favour of the existence of quaternary man; and this declaration, made by the President of the Geological Society of London, added considerable weight to the new ideas." p. 11.

Correction.

"This communication was read in 1840, not 1842.

Mr. Mac Enery's labours in Kent's Cavern began in 1825, and did not extend to 1847, as he died on 18th February, 1841.

Mr. Pengelly was not on the Continent in 1858, was never on the Continent with either Professor Prestwich or Dr. Falconer, and was never in or near the Hartz.

The meeting of the British Association at Aberdeen was held in 1859, not 1855. Sir C. Lyell was not at that time President of the Geological Society of London, nor had he been at any time after 1837.

He who quotes at second hand through M. Figuier, should certainly be prepared to be led astray.

To return to Mr. Howard. The quotation from Figuier led him to regard the rolled stones of distant derivation, found in Kent's Cavern, as consequences and proofs of diluvial action. That part of Quotation XVI. C., to which I now refer, contains two passages within inverted commas, and the reader is referred for the first of them to the "Third Report of Committee, p. 6." [= *Rep. Brit. Assoc.*, 1867, p. 29], and there it will certainly be found. Mr. Howard's entire paragraph, however, is so constructed that every reader would probably suppose that the second passage was derived from the "Third Report also," and there I sought it accordingly. It turns out, however, to be taken, slightly "improved," from the Fourth Report of the Committee. (*Rep. Brit. Assoc.*, 1868, p. 53.)

Two stones from the Start district, and a few more from the Dartmoor region,—all of them very small—can give little support to the hypothesis of a series of Deluges, even if they cannot otherwise be accounted for; and whilst, as pointed out in the Second Report, quoted already, there is a possibility, to say no more, that they were relics of gravel once widely-spread over south-eastern Devonshire, we are absolved, so far as these stones go, from the necessity of invoking diluvial action in the Torquay district during the era of the Cave-earth. Of the existence of this old gravel in the locality there is no kind of doubt; that the era of its deposition was long before that of the Cave-earth is also certain; that the gravel was in process of dislodgement during the Cave-earth period admits of little, if any, doubt; the presence of such stones in the Cavern is what might have been anticipated under the circumstances; and if there be anything surprising about them, it can only be that they are so few.

Mr. Howard can certainly find in Mr. Mac Enery's *Cavern Researches* ample justification for the term "fetid" in the Quotation XVI. E., as well as for the statement that Mac Enery "nearly lost his life, and certainly impaired his health, in the research." Nevertheless, the occurrence of both the term and the statement in the *Researches* never fails to surprise me; for in upwards of fifteen years' continuous research—a very much longer period than Mac Enery's researches covered—during which we broke a great deal more virgin ground, and penetrated into a greater number of new chambers and galleries than he did, neither the workmen nor I have in a single instance encountered any "fetid odour" (*Trans. Devon. Assoc.* iii, 288), or "foul air" (*Ibid*, 233), or any "intolerable sickening

smell" (*Ibid*, 292), nor, beyond chronic rheumatism, contracted unfortunately by the foreman, and ascribable, no doubt, to the continuously humid atmosphere in which his share of the work kept him many hours every day, have any of us reason to say that our health has been impaired in the investigation.

The thirty-five years separating the beginning of Mac Enery's researches from that of ours, is so very small a fraction of the entire period of inhumation, even if his chronology were adopted, that it may be utterly ignored. Animal remains which had retained the power of emitting a fetid odour from the days of Noah to the year 1825, A.D., might be confidently expected to retain it 35 years longer, especially as during the latter period the Cavern had been closely shut up, but was previously open to all comers, at all times; yet, if the remains ever had any offensive powers or qualities, they have utterly lost them now.

Again, if the eruption of a flood drove carcasses into vast cemeteries (Quotation XVI. E.), it might have been expected that, waiving the question of odour, the skeletons would not only be entire, but the bones would lie in their true anatomical juxtaposition; yet, this was so very far from being the case that, with the sole exception of jaws containing their teeth, the greatest number of bones I ever found thus associated was three—the distal end of a tibia, the astragalus, and the os calcis, of Horse; and even in this case, the fragment of tibia bore unmistakable evidence that it had been broken and gnawed by a Hyæna. We have disinterred many thousands of bones, and yet the foregoing instance was so unique that I took care to tie the bones together exactly as they were found; and in that state they remain at present. They prove that a Hyæna had made a meal from the leg of the Horse, and having satisfied himself, left a sufficient amount of fleshy or ligamentous matter to hold the bones together.

Derivation of the Materials of the Breccia.

Quotation XVII.: "‘Lastly, we reach the period of the breccia, when there was carried into the cavern (but how and from whence?) a loam of darker red and rock fragments, of more distant derivation than those which compose the cave-earth.’" p. 12.

As Mr. Howard's inverted commas show, Quotation XVII. professes to be cited by him, though it is unattended by any reference. The original, however, will be found in *The Ancient Cave Men of Devonshire*, p. 16; and it will also be found that

Mr. Howard, without anything to indicate the fact, has interpolated a parenthesis, asking two questions ; and, by transposing a comma from after the word "red" to after the word "fragments," he has made the sentence convey a meaning somewhat different from that of the original. My statement was that there were in the Breccia, "rock fragments of more distant derivation than those which compose the Cave-earth." Mr. Howard makes the statement apply equally to the loam, about which I had no intention of saying anything, one way or the other.

Mr. Howard's parenthesis asks, "how and from whence" the Breccia was carried into the Cavern. There is no difficulty about the "Whence," as indeed was stated, by implication, in the Report on the Cavern containing the first mention of the Breccia, where it is said of the stones constituting the chief feature of that deposit, "none of them were of very distant derivation." (*Rep. Brit. Assoc.*, 1868, p. 53.) Mr. Howard is very well acquainted with this sentence, and could scarcely have failed to know that it implied a knowledge of rocks *in situ* which could, and probably did, supply the materials.

In my first *Science Lecture* at Glasgow (December, 1875), mentioned in Mr. Howard's *List of Works Consulted*, when speaking of the stones so abundant in the Breccia, it is stated that "they must have come from the more distant heights." (p. 15.) In short, everyone acquainted with the local geology must be satisfied that the stones in question came from Lincombe Hill, the summit of which is less than half a mile S.W. of the Cavern, and rises about 200 feet above the top of the Cavern Hill.

With regard to "How" the Breccia was carried into the Cavern. The forms of the stones show clearly that they were transported by water, and that they had travelled neither long nor far ; for whilst some of them are well-rounded, most of them are sub-angular. Again : The volume of the largest amongst them is not such as to demand the violent rush of a great body of water. Some slight alteration in the local physical geography, the two recently-discovered western entrances open, and such occasional heavy rainfalls as occur in the present day in the Torquay district, would, I opine, be a machinery amply sufficient to produce the phenomena.

Flint and Chert Implements in the Breccia.

Quotation XVIII. : "Even here" [in the Breccia—the oldest of the Cavern deposits, so far as is known], "I regret to say, 'were indications of man ; for a flint flake and a *perfectly angular* and sharp flint chip were found three feet deep in the

*breccia, mingled with the remains of the bear.** 'The flake is undoubtedly the most ancient human relic that up to this time the cavern has yielded.'

"Sir Charles Lyell says, 'three flint implements and one flint chip.' Mr. Boyd Dawkins says, 'four flint implements.' † I have no means now of reconciling this diversity, nor have I examined these ancient specimens. The fact is that I once asked Christy (who was my friend and schoolfellow) how many of the flint implements he thought genuine, and he replied, 'about eighty per cent.' Since then my belief in them generally has been conformed to the above proportion.

"To assume from these flints the joint tenancy of the bears' den, as divided between these interesting animals and man, would indicate a credulity beyond that of 'the Jew Apella.' Nor is alternate tenancy much more probable. 'In the very bed containing their bones [in another part of the cave?] ‡ a rude knife-shaped piece of iron was detected much corroded.' How did this come there? (Mac Enery, p. 286)" [or *Trans. Devon. Assoc.* iii. 458]. "Was the smelting of iron also known 100,000 years ago?" pp. 12, 13.

Mr. Howard's expression of "regret," that even in the Breccia "there were indications of man," may, of course, be taken as an admission that he finds it difficult to bring the fact into harmony with the popular short chronology.

He reminds the reader that whilst my *Ancient Cave-Men of Devonshire* states that the Breccia had yielded a flint flake and a flint chip, Sir C. Lyell, in a passage for which we have no reference, but which will be found in the *Antiquity of Man*, 4th ed., p. 106, says "three flint implements and one flint chip," and that Mr. Boyd Dawkins says "four flint implements;" and he then adds, "I have no means now of reconciling this diversity." I cannot help believing that most persons would have turned to the title pages to ascertain the dates of the three works, and, on finding that they were 1872, 1873, and 1874 respectively, would conclude that the diversity denoted, not something requiring to be reconciled, but the progress of discovery, especially as it was well known that the work of exploration was continuously carried on from long before the first to long after the last of the dates. It may not be out of place to state here that up to the date on which this statement was written—June, 1880—the Breccia has yielded nearly 80 flint and chert implements, flakes, and chips.

* "The Ancient Cave Men of Devonshire, p. 15." † "Cave Hunting, p. 328."

‡ These square brackets with the six words within them are Mr. Howard's.

I do not feel at all sure that I understand what was the exact question Mr. Howard put to Mr. Christy, or that the one answered the actual query put to him by the other. An answer to, "How many of the flint implements he thought genuine" should hinge on the interpretation of the word "genuine." Did it mean real antiques—not modern forgeries? or did it mean undoubted artificially-produced tools—not natural products? Perhaps the simplest course is to assume that both ideas were covered by the answer, as well as by the question.

Mr. Howard's plan of accepting 80 per cent., that is four out of every five, betokens a beautiful faith in an old school-fellow. It is also very simple and calculated to save a world of trouble, except when the number to be dealt with is not an exact multiple of five, when it must be admitted to have awkward defects. On this plan, however, the Kent's Cavern Breccia stands well; for it has yielded about 60 "genuine" implements; that is, so far as the evidence goes, about 60 proofs of man in Devonshire before the arrival of the Cave-hyæna into our county.

It appears that Mr. Howard has found that some persons have ventured "to assume from these flints" [the four, at most, of which he speaks] "the joint tenancy of the bears' den, as divided between these interesting animals and man." I presume from the context—though that is not very clear—that his "interesting animals" were Bears. I can only express my entire ignorance of any one having assumed that Men and Bears were ever joint tenants of any part of the Cavern; that Men and any infra-human animals were ever joint tenants of the "Bears' Den;" that Men and any infra-human animals were ever joint tenants of any part of the Cavern during the era of the Breccia, to which the flints he was speaking of belonged; or that Man was an occupant of any part of the Cavern during the deposition of the Breccia. The flints, in my judgment, prove incontestably the existence of Man in the Torquay district during the period under consideration, but they, perhaps, *prove* no more than that. I may add that none of the flints—four at most—of which Mr. Howard speaks were found in the "Bears' Den," and that two of them were met with very far from it.

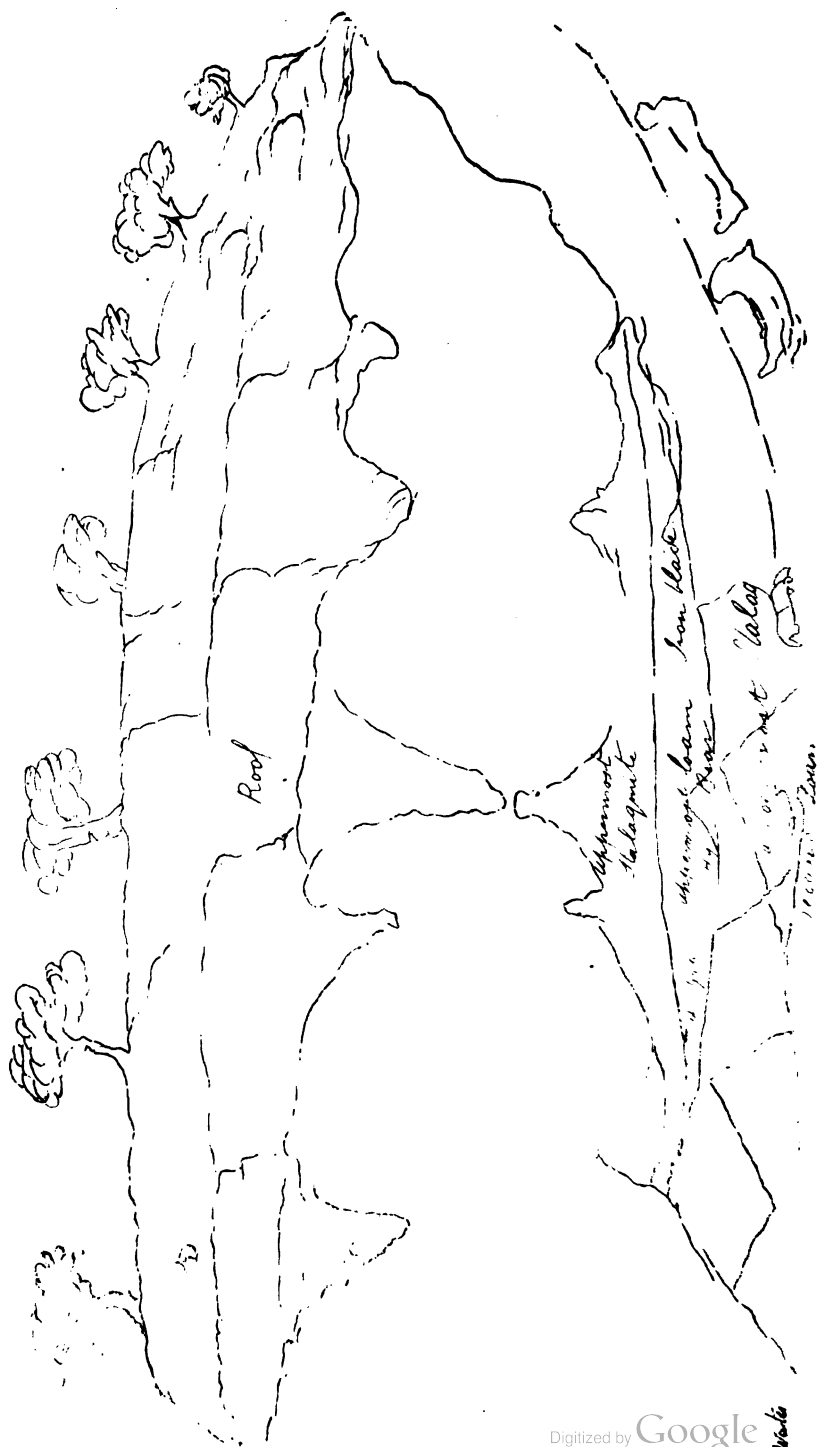
When, however, he goes on to say "Nor is alternate tenancy much more probable," he no doubt has his eye on the following passage in *The Ancient Cave Men of Devonshire*, p. 12: "But man was not the only inhabitant of the cave. The gnawed bones, and the coprolites still occupying the spot where they were dropped, and retaining their original form,

conclusively show that the hyæna also made it his home—not jointly, however, but alternately with the human tenant. In a climate like ours, *savages* would probably require at least forty square miles each on which to live; and if it be supposed that, for mutual protection and aid, they lived in companies, say of ten persons, they would need four hundred square miles, or an area equivalent to twenty miles in length by as many in breadth, in order to obtain the means of subsistence. Under such circumstances, there must have been frequent migrations from one cavern home to another; and during their absences the hyænas would take possession, to be dislodged on their return.”

It will be seen, then, that my hypothesis was the alternate tenancy of the Cavern by Men and *Hyænas*—not Men and *Bears*; and that this occurred during the era of the Cave-earth, when hyænine relics were inhumed in the Cavern in great abundance;—not in the era of the Breccia, when, so far as the evidence goes, there were no British *Hyænas*.

Mr. Howard is of opinion that the hypothesis of alternate occupancy is not “much more probable” than that of joint occupancy. I venture to say in reply that the idea of Men and *Hyænas* living in a cavern at distinct alternate periods is perfectly conceivable, whilst that of their living there at one and the same time is not. Moreover, alternate occupancy is not without parallels in our own day. Thus, the Rev. Canon Tristram, well-known as a naturalist and traveller, writing me in 1871, said that he had mentioned in a paper on Tunis and its interior that several of the old Roman cisterns and crypts in the south of that Regency are used by the Arabs for shelter and for cattle-folds during their sojourn in the locality, and that when they have cleared off the pasturage and gone, the *Hyænas* return and take up their quarters in these dens. “I may add,” he continues, “that at Rabboth Ammon (now Amman), in Gilead, east of Jordan, I found plenty of the well-known droppings of *Hyænas* in the vomitoria of the theatres, in places which are covered with the manure of the beasts which the Arabs stable there during their sojourn every spring in the place.” Further, Humboldt states that much the same thing occurs in the case of the Jaguar of South America. It seems rather unfair to the Cave-earth Men and *Hyænas* of Britain to deny them the habits and privileges enjoyed by their modern kith and kin in Africa and Asia.

Having to his own satisfaction disposed of the novel and gratuitous hypotheses of Men and *Bears* having jointly or alternately tenanted the *Bears’ Den* in the Breccia period, Mr.



Howard proceeds at once, without break of paragraph, to quote the following words from Mr. Mac Enery: "In the very bed containing their bones a rude knife-shaped piece of iron was detected much corroded." The ordinary reader, not, perhaps, having the original at hand, must, of course, suppose that the "very bed" was that which yielded the four flint implements under notice; and that "their bones" were necessarily those of Bear, as no other animal was mentioned or alluded to in the paragraph. Here, however, our author has again fallen into a method of advocacy; the passage is wrenched from its own context and incorporated in a paragraph to which it is foreign. Moreover, the citation is from "that thing of shreds and patches," Fasciculus J. in Mr. Mac Enery's *Cavern Researches*. But waiving this, the reader will find on going to the original, that Mac Enery is speaking, not of Bears alone, but of Bears and Hyænas; not of the Breccia, in which no relic of Hyæna has ever been found, but of the Cave-earth, in which bones of Bear, Hyæna, and many other animals occur. If Mr. Howard be well acquainted with his Mac Enery, he knows that a fuller mention of this "find" occurs in Fasciculus C., of the *Cavern Researches* (*Trans. Devon. Assoc.* iii. 306), where, describing the Bears' Den, Mac Enery says, "An irregular crust overspread the floor. . . . This crust was about a foot thick, and was based on a shallow bed of indurated rubble . . . a great abundance of a "[lbum] "Græcum were observed in it, mingled with an unusual proportion of Bears' teeth. On further examination it was found to exhibit a modern character by the presence of an iron blade much corroded." Again, Mr. Howard must be aware that his copy of the *Researches* contains a Plate by Mac Enery, facing page 123. (*Trans. Devon. Assoc.* iii. 311.) This Plate, now reproduced, represents the section in which this very "find" was met with, and shows, in descending order, the following deposits, described in Mac Enery's words:

"Upper Stalagmite."

"Uppermost loam. A "[lbum] "Græ "[cum]. "Hy "[æna] "Bear, Iron blade."

"Undermost Stalag "[mite].

"Second loam."

There can be no manner of doubt, therefore, that the Iron blade was found, not *in* or *on* the Breccia, or Mac Enery's "second loam, but *in* or *on* the Cave-earth. So much for giving a few words a new context.

With regard to the Iron blade Mr. Howard asks three questions. The first is to the effect, Was the Iron blade

found in a part of the Cave other than that in which the four flints he mentioned were found? The reply is, It *was* in another part of the Cave. The Iron blade was met with in the Bears' Den, but not one of the four flints was found there. This Mr. Howard could have answered for himself had he studied the books named in his *List of Works Consulted*.

The second question is, "How did *this*" [Iron blade] "come there?" It happens that I virtually answered this question nearly a year before Mr. Howard's last visit to the Cavern. In the Thirteenth Report on the Exploration I quoted the passage cited above from Mac Enery respecting this very "find," added the Plate mentioned already, and closed that part of the Report with the following paragraph: "It cannot be doubted that such cracks" [in the Stalagmitic Floor] "as Mr. Mac Enery describes, if at all approaching in width to that still existing in the Stalagmitic boss" [in the Bears' Den], "must be a possible, and, indeed, probable, source of uncertainty respecting the position and relative chronology of some of the objects found in the underlying deposit, especially if, as he states, this deposit shared in the disturbance; for it must be supposed that portions of the overlying Cave-earth or, as Mr. Mac Enery calls it, the Rubble-bed, together with teeth, bones, and coprolites, such as he found in it, would pass down the cracks, and be lodged *on*, and perhaps *in*, the underlying Breccia" (*Rep. Brit. Assoc.*, 1877, p. 5). If Mr. Howard's "personal investigations" of the Cavern be worth a rush, if they be not a great snare, he could answer his question for himself, and he would know that potted anachronisms in the Bears' Den—even a coin bearing a portrait of Queen Victoria lying in the Breccia—ought to produce no surprise; and he would know also that nothing of the kind could occur in any other part of the Cavern.

One is tempted to answer Mr. Howard's third question—"Was the smelting of iron also known 100,000 years ago?"—by asking, first, What could have made you put such a question? and, secondly, Do you assume that the presence of an Iron blade necessarily presupposes the smelting of iron? and to add that Egyptologists are believed to have found it necessary to refrain from such an assumption. If, however, he insist on a definite reply from me, I can only say that I had not supposed the art of smelting to be anything like so *very* old; that I can say nothing with certainty one way or the other; but that if he or any other person can do so, I shall be delighted to learn what it is. Nevertheless, I hereby give timely notice that if I am asked to believe in anything like an

approach to so very great an antiquity as 100,000 years for the art of smelting iron, the effort will be utterly thrown away unless the evidence be of the soundest and most conclusive character.

Dislodgement of Gravel.

Quotation XIX: "The gravel of which Mr. Pengelly speaks as probably occupying the valley, and requiring an immense time to excavate, might have been *washed out* in a single night." p. 14.

The ordinary reader would probably feel that Mr. Howard was a little tantalizing here, inasmuch as he fails to state of what gravel and what valley I speak, and fails also to give any clue or reference as to where I speak of them. He may have had under his eye my paper on *The Antiquity of Man in the South-West of England* (*Trans. Devon. Assoc.* iii. 129-161), or my third *Science Lecture* at Manchester. (Eighth Series, pp. 141-159.) In the latter the following statements occur: "The hypothesis that best explains the facts is this—that at the time the Cave-earth was carried into the Cavern it was introduced in very small instalments, or minute quantities at a time, and after some interval a further small quantity, and so on. In the intervals the Cavern was inhabited by wild animals and by men, not jointly, but alternately. . . . Now we are compelled to believe that at that time the bottom of the valley was a little, and but very little, below the level of the entrances, and in times of flood, such floods washed over the lip, so to speak, into the Cavern, and carried in small instalments of Cave-earth. That was repeated until the bottom of the valley had been worn so low that even a flood never entered the Cavern. After that nothing more was carried in, and there was an uninterrupted precipitation of stalagmite. It is a mistake to suppose that stalagmite was not being precipitated during the introduction of the Cave-earth. We know perfectly well that it was So far as we have gone, we have to ask for time sufficient to cut down the valley seventy feet deeper, after the introduction of the Cave-earth had ceased. . . . When standing on the Cavern hill, and observing that it consists entirely of hard semi-crystalline limestone, and when it is found that the hill on the other side is made up of the same hard limestone, one cannot but feel that it would take an amount of time equal to what, with our finite powers, we understand by the word 'eternity' to cut down that mass of limestone to a depth of 70 feet. . . . The amount of time

thus demanded is appallingly great, and I rather incline to the opinion that after all there must be some way of evading that difficulty. Now let us suppose that the valley had existed long, long before the period now under consideration; let us suppose that it had been filled up with gravel, and let us suppose that the bottom of the valley, when the water occasionally washed into the Cavern, and carried in the Cave-earth, instead of being a limestone bottom, was simply a gravel bottom; and let us suppose that the excavation I have spoken of was not a *primary* but a *secondary* excavation, in fact a *re-excavation*, a washing or scooping out of the gravel." (*Op. cit.*, pp. 143-4.)

Having furnished evidence in favour of the hypothesis of the former existence of gravel in the valley, I spoke of being "very glad to have this reason for believing in this re-excavation; for I repeat that I am rather appalled by the amount of time I should find myself compelled to provide for if it were not for this idea of re-excavation." (p. 146.) Finally, I proceeded to show that the time occupied in dislodging the gravel was but one in a series of chronological terms, the sum of which separates us from the men of the Cave-earth era.

Mr. Howard says the gravel "might have been washed out in a single night." I am not aware of having ever even whispered that it *might not* have been; but it has neither happened to me to witness phenomena on anything like so grand a scale, nor to meet with any one who has been so fortunate. Such an achievement is, no doubt, conceivable and, so far as is known to me, possible; and on the receipt of sufficient evidence it would, of course, be accepted as actual. In the meantime it should be remembered that we have to deal, not with what *might have been*, but what *was*; and that all the correlative facts appear to tell a very different story.

Mammals of the Submerged Forests of Devonshire.

Quotation XX.: "These" [Devonshire] "shores were at some time surrounded by low-lying forests, filled with the very same creatures, both predacious and otherwise, to whose remains our attention has been directed." p. 20.

In Mr. Howard's paper the foregoing Quotation XX. is followed by a description of molar teeth of Mammoth found in the Submerged Forests of Torbay and Sidmouth, the whole being obviously compiled, but without the least acknowledgement, from my *Notes on Recent Notices of the Geology and Palæontology of Devonshire*, part i. (*Trans. Devon. Assoc.*, vi,

646-685), which Mr. Howard has so flatteringly quoted again and again. He very distinctly implies that the subject was entirely new to him, and there does not appear to be the least error in believing that what he knows about it he has been able to read up from such of my papers as appear in his *List of Works Consulted*. Besides those of the Mammoth, he mentions no relics of a single species of mammal found in the Forests; nevertheless, he does not hesitate to say in effect, as we have seen, that the Forests were "filled with the very same creatures, both predacious and otherwise," as were found in the Cavern. The following Table, showing the mammals found in the Cavern Cave-earth and in the Forests, so far as is known, will enable the reader to appraise this statement:

NAMES.	CAVERN.	FORESTS.
<i>Machairodus latidens</i> . . .	x	...
Lion	x	...
Wild Cat	?	...
Lynx	?	...
Hyæna	x	...
Wolf	x	...
Fox	x	...
<i>Canis isatis</i>	?	...
Glutton	x	...
Badger	x	...
Cave Bear	x	...
Grizzly Bear	x	...
Brown Bear	x	...
Mammoth	x	x
<i>Rhinoceros tichorhinus</i> . . .	x	...
Hog	x	x
Horse	x	...
Wild Bull	x	...
Bison	x	...
Long-fronted Ox . . . . .	...	x
Gigantic Irish Deer	x	...
Red Deer	x	x
Reindeer	x	...
Sheep or Goat . . . . .	...	x
Hare	x	...
Cave Pika	x	...
Water Vole	x	...
Field Vole	x	...
Bank Vole	x	...
Beaver	x	...

In the Table the cross (×) denotes the presence of a species, the points (...) its absence, and the query (?) shows that further evidence is desiderated. The Table teaches us that whilst the Cave-earth of Kent's Hole has yielded remains of 28 species of mammals (including the three somewhat doubtful forms), the Submerged Forests have yielded no more than 5; that whilst the Long-fronted Ox and the Sheep or Goat have been found in the Forests, they have not been found in the Cave-earth of the Cavern; and that, notwithstanding Mr. Howard's statement to the contrary, not a single relic of any predaceous mammal has been detected in the Forests, so far as is known. I may add that relics of the species—Long-fronted Ox and Sheep or Goat—found in the Forests, but not in the Cave-earth of Kent's Hole, have been found abundantly in the overlying Black Mould—the most modern relic-containing deposit—of the Cavern. In short, every one having the slightest scientific acquaintance with the local geology knows perfectly that the Forests are very much more recent than the Cave-earth of either Kent's Hole or Brixham Cavern.

Insulation of St. Michael's Mount, Cornwall.

Quotation XXI: "I wish to pay all respect to calculations of Mr. Pengelly, which assign 17,000 years as the period which has elapsed since the subsidence of the wood-covered shores of the bay. Mr. Pengelly, at all events, gives reasonable calculations (whether dependable or not) for his opinion

"Only this calculation seems to me to prove too much, for nothing is more certain than that St. Michael's Mount, which is now surrounded by the sea at high water, used to be called in the Cornish language (*carreg luz en kuz*), 'the hoary rock *in the wood*,' and subsequently in Norman-English, 'Le hore rock *in the wood*;' and notwithstanding the great opinion which I entertain of the antiquity of the Cornish and the allied Welsh and Briton languages, I hesitate to assign to them an unchanged duration of 17,000 years." p. 31.

The ordinary reader would, of course, understand from the first paragraph in Quotation XXI. that I had somewhere made calculations "which assign 17,000 years as the period which has elapsed since the subsidence of the wood-covered shores of the bay." I admit the calculations; but deny that they

had anything whatever to do with the date of the *subsidence*; and I caution the reader against believing that the "bay" mentioned above was Torbay. The facts are as follow:

In 1867 I printed a paper on *The Antiquity of Man in the South West of England* (*Trans. Devon. Assoc.* ii. 128-161), in which a good deal of space was devoted to St. Michael's Mount in Cornwall. This paper is one of those in Mr. Howard's *List of Works Consulted*, and was, no doubt, under his eye when writing the passage quoted above.

The Mount is an island at every high water, but, with very rare exceptions, a peninsula at every low water. No one can doubt that it was once a part of the Cornish mainland, and that its present condition is ascribable either to encroachment of the sea—that is the wasting of the land—without subsidence; or to the subsidence of the district, with or without encroachment. The calculations to which Mr. Howard refers were made for the purpose of proving the untenability of the former hypothesis—insulation through encroachment only. On page 140 of the volume containing my paper, the following passage occurs: "If, from the foregoing data, the retrocession of the sheltered cliffs be taken at ten feet in a century—probably a high estimate—the Mount could not have become an island within the last 16,800 years; and it must be borne in mind, that on the hypothesis at present under review—insulation by encroachment alone—the submergence of the forests must have been still earlier."

On a later part of the same page, I add, "Though the hypothesis of insulation by encroachment only, carries back the era of submergence fully 17,000 years from the present time, the rival supposition—that the severance of the Mount from the mainland was the result of the subsidence of the country—leaves the chronology of the event an open question. It may have happened in more modern or in more ancient times." My calculations, therefore, had reference, not to subsidence, but to a rival hypothesis, which I rejected; and the "bay" was not Torbay, but the Mount's Bay.

Since Mr. Howard says that "nothing is more certain than that St. Michael's Mount, which is now surrounded by the sea at high water, used to be called in the Cornish language (*carreg luz en kuz*), 'the hoary rock in the wood;'" it is to be feared that he has not read *The Insulation of St. Michael's Mount*, in Professor Max Müller's *Chips from a German Workshop* (iii., 330-357, 1870), nor the correspondence between

the learned Professor and me in *Nature* (iii, 206 and 245), nor my paper, having the same title as the Professor's "Chip," in the *Journal of the Royal Institution of Cornwall* (iv., No. 13, pp. 1-26, 1872); for had he done so he would have learnt, thanks to Professor Max Müller's researches, that the legend of the forest, referred to in the name—"The hoary rock in the wood"—belonged really and honestly to Mont St. Michel in Normandy, not to St. Michael's Mount in Cornwall.

Mr. Howard says of my calculation, it "seems to me to prove too much;" and then, having mentioned the supposed Cornish name of the Mount, adds, "notwithstanding the great opinion which I entertain of the antiquity of the Cornish and the allied Welsh and Briton languages, I hesitate to assign to them an unchanged duration of 17,000 years." It cannot be possible that Mr. Howard claims this idea as his own, or wishes anyone to believe that it is so. As long ago as 1865 I read to the Geological Section of the British Association, at Birmingham, a paper on *The Insulation of St. Michael's Mount in Cornwall*, and on 5th April, 1867, delivered a lecture, under the same title, at the Royal Institution, Albemarle Street, London. I have the MS. of the former still by me, but it was never printed; an abstract of the latter will be found in the *Proceedings of the Royal Institution* (v., 128). In the correspondence in *Nature*, already mentioned, I gave, in a condensed form, the substance of my paper of 1865, and said, "the hypothesis of insulation by encroachment only, appeared to demand the belief that at least twenty thousand years ago Cornwall was inhabited by men who spoke a language which prevailed in the same district to within a very few centuries of our own time, and which, from its similarity to the Welsh, might be said to be spoken still by a large population within our own island. Believing this conclusion respecting the antiquity of the Cornish language to be utterly untenable, I at once rejected it, and, with it, the hypothesis of insulation by encroachment merely, remarking of it that it 'squandered time most lavishly.' . . . The point of my argument was that the hypothesis of insulation by encroachment without subsidence could not be admitted, because it led to an untenable philological conclusion.

"Turning next to the hypothesis of insulation through subsidence . . . I proceeded to show that the numerous submerged forests which skirted the western coasts of England . . . were to the geologist sufficient and satisfactory proof of a general subsidence of the country; and then pointed out that whilst, on the one hand, this change of level could not

have occurred within the last 1,900 years, since, about 9 B.C., the Mount was described by Diodorus Siculus in terms which apply admirably to it at present; on the other hand, it could not have taken place in times geologically remote, since the forests consisted of plants still indigenous to the district, and contained remains of beetles retaining all their beautiful colours, as well as the horns of the red deer, which man had fashioned into tools." (*Nature*, iii., 207. January 12th, 1871.)

Such was my opinion in 1865, such it remains at present, and whatever I have written on the subject in the interval will be found in harmony with it. I am sorry for Mr. Howard; but I cannot refrain from saying that my calculations did not assign 17,000, or any other definite, or even approximate, number of years, "as the period which has elapsed since the subsidence of the wood-covered shores of the bay;" nor can I forego the satisfaction of stating that I anticipated him by several years in recording my refusal to assign to the Cornish language "an unchanged duration of 17,000 years."

I have now completed my "Notes" on Mr. Howard's remarkable paper. They occupy even more space than I had foreseen when writing Captain Petrie in 1879, but I have found great difficulty in confining them within their present limits. Mr. Howard admits the genuineness of the "flint tools," and the contemporaneity of the men who made them with the extinct Cave mammals. I ask for no more from him. With his *belief* that the Mammoth not only lived since Man practised the literary art, but was, indeed, the Behemoth of Job xl. 15-24, I have here nothing whatever to do.

IV. PROFESSOR BOYD DAWKINS ON KENT'S CAVERN, 1880.

Early Man in Britain and his Place in the Tertiary Period. By W. Boyd Dawkins, M.A., F.R.S., F.G.S., F.S.A., 1880, contains the few occasional mentions of Kent's Cavern, quoted below, on which a note or two may be of use.

The Breccia in Kent's Cavern.

Quotation I.: "The first evidence that there were in the caverns of this country two distinct sets of Palæolithic implements, is that presented by Kent's Hole. . . . In the lowest strata of crystalline breccia are rude implements of the River-drift type, in association with the remains of bear." p. 194.

There is a slight inaccuracy in the expression "the lowest strata of crystalline breccia," the word "crystalline" being inapplicable. The Breccia, containing the rude implements spoken of, was a strictly mechanical deposit of subangular and rounded stones commingled in a dark red sandy paste, and there was nothing of a crystalline character about it. This Breccia, however, was covered and sealed with a thick sheet of stalagmite termed, from its prevalent character, the "Crystalline Stalagmite." The adjective was misapplied; it belonged, not to the Breccia, but to the Stalagmite formed on it, but distinct from it.

Palæolithic Bone Tools of Kent's Cavern.

Quotation II.: "Above the breccia is the cave-earth, in which flint implements are by far more numerous and of a higher form" [than in the Breccia] . . . "A bone needle also was met with, and bone awls, and two harpoons of reindeer antler, the one barbed on one side, and the other on both sides." pp. 195-6.

The statements in the passage just quoted are not in all cases strictly accurate. Beginning with the uppermost, that is the most recent, deposit containing remains of *extinct* animals, and proceeding thence in descending order, there were—

1. A Sheet of *Granular Stalagmite*.
2. A thin bed consisting mainly of charred wood, found near one of the entrances only, and termed the *Black Band*.
3. An accumulation of light red clayey loam, with small angular fragments of limestone, and termed the *Cave-earth*.
4. A Sheet of *Crystalline Stalagmite*.
5. *The Breccia*, mentioned previously.

The Black Band (2) may no doubt be regarded as essentially included in, and belonging to the Cave-earth period; the Band being the result of human occupancy near the close of the Cave-earth era.

The following Table will show the chief facts connected with the principal bone tools found with remains of extinct mammals in the Cavern. The numbers in the left column are those of the "find" to which the tools belonged respectively, as recorded in my Journal.

NOs.	TOOL.	DEPOSIT.	WHEN FOUND.	FIGs.
1885	Awl	Black Band	Nov. 27, 1866	5-407
1847	Needle	Black Band	Dec. 4, 1866	6-408
1929	' Pin	Cave-earth	Jan. 3, 1867	7-406
1970	Harpoon	Black Band	Jan. 18, 1867	...
2067	Perforated Tooth	Cave-earth	Feb. 4, 1867	...
2206	Harpoon	Cave-earth	March 7, 1867	8-404
2282	Harpoon	Cave-earth	March 18, 1867	9-403

The numbers in the right column, "5-407" for example, are those of the figure ("5") of each specimen in my paper on *The Flint and Chert Implements found in Kent's Cavern*, in the *Transactions of the Plymouth Institution* (vol. v., pp. 341-375); and ("407") in Mr. John Evans's *Ancient Stone Implements, Weapons, and Ornaments of Great Britain*.

Of the three harpoons mentioned in the Table, Nos. 1970 and 2206 are barbed on one side only, whilst No. 2282 is barbed on two sides. Professor Dawkins alludes, no doubt, to the only two that have been figured, as shown in the Table. It is, perhaps, not improbable that the harpoons were made of reindeer antlers, but no attempt has been made to determine this point.

Did Neolithic Man inhabit Kent's Cavern ?

Quotation III. : "The Neolithic inhabitants of Britain also used caves for habitation, such as those of North Wales . . . the Victoria in Yorkshire, and Kent's Hole in Devonshire. The refuse-heaps in each of these contain the remains of the same wild and domestic animals, and, in addition, those of the bear and the wild boar." p. 271.

It may be doubted whether there is any satisfactory evidence that *Neolithic Man*—Man who made polished stone tools, but was ignorant of the use of metals—used Kent's Hole for habitation. There was overlying the Granular Stalagmite, mentioned in the Note on Quotation II., a deposit known as *The Black Mould*, where, if anywhere, this evidence would have been met with. It contained abundant traces of men of the *Bronze* and *Iron Ages*, but the Committee appointed by the British Association to explore the Cavern

found not a single indication of the Industrial Arts, or of the presence of Neolithic Men; and so far as I know, the only indication of the kind was one polished stone tool found by Mr. Mac Enery in the Black Mould (see *Trans. Devon. Assoc.* iii. 299), "but even this specimen would scarcely be conclusive, as such tools may have been used for sacred or symbolical purposes long after the Neolithic period had ceased." (See my *Second Glasgow Science Lecture*, 1877, p. 23.)

V. DR. DAWSON ON KENT'S CAVERN, 1880.

Fossil Men and their Modern Representatives. By J. W. Dawson, LL.D., F.R.S., F.G.S., Principal of McGill College and University, Montreal, 1880, contains the following paragraph:

"Pengelly, in a recent paper on the Flint Implements from Kent's Cavern, holds that man may have existed in Devonshire in or shortly after the first continental period. This conclusion, however, requires us to believe that the oldest deposit of Kent's Cavern is of this age, and that the flints found in it are really of human workmanship. Neither of these data can as yet be considered as established." Foot-note, p. 233.

Dr. Dawson, in the passage quoted, alludes, no doubt, to my paper on *The Flint and Chert Implements found in Kent's Cavern*, read to the *Plymouth Institution*, on 18th February, 1875, and printed in the *Transactions* of that body. (v. 341-375.)

Be that as it may, he expresses very accurately the opinion enunciated in the said paper, and which opinion I hold still. Dr. Dawson does not attempt to deal with my reasons for believing in the great antiquity of the "Breccia"—the oldest deposit of Kent's Cavern; and he disposes of the flints found in it with the sceptical opinion that it cannot as yet be considered established that they are really of human workship. I can only reply that he has never seen the flints in question; that no one who has seen them, and whose opinion on such questions is usually held to be entitled to acceptance, shares this scepticism; and that, whilst regretting that he should have allowed himself to be betrayed into an expression of opinion for or against objects which he has never had an opportunity of *knowing* anything about, I have sufficient confidence in his candour as well as in his ability, to feel sure

that on seeing them he will recall his expression of gratuitous unbelief.

VI. B. C. H. ON KENT'S CAVERN, 1880.

A copy of *The Earlhamite*, for April, 1880, vol. vii., No. 7, published at Richmond, Ind., reached me through the Post Office, having been forwarded, no doubt, because it contained an Article, by "B. C. H.," entitled *The Cave of Torquay*, which, it is needless to say, signifies Kent's Cavern. The article, though very short, is long enough to contain errors, which may as well be quoted here, and corrected.

A Bone Cavern at Bovey Tracey.

Quotation I.: "There are two more similar caverns in Devonshire, but a few miles away, viz., Brixham Cavern and Bovey Tracey cave, with others of minor importance, all of which have analogies to each other, and have been similarly explored, with like results." p. 152.

This is the first and only mention I have ever seen of a cave at Bovey Tracey. The writer has probably supposed that some researches I conducted near that little town in 1860, were devoted to a cavern there, instead of to the well-known deposits of Clay, Sand, and Lignite, for which Bovey is famous. So far as I am aware, there is no cavern in the parish of Bovey Tracey.

Quotation II.: "No one is permitted to enter this cave without a permit from W. Pengelly. The Prince of Wales went to see it not long since, but the boy in charge would not let him in without a *permit*. He gave the boy half-a-crown for his faithfulness." p. 153.

If "B. C. H." be the American gentleman I suppose him to be, he was in England last September and October (1879), and no doubt saw a paragraph, either in the *Whitehall Review*, where it appeared first, or in one of the numerous papers into which it was copied. The following, taken from the *Torquay Directory* for 1st October, 1879, is the paragraph to which I refer:

VISITORS AT KENT'S CAVERN.—While the Prince of Wales was at Torquay two strangers, one of whom was in a yachting suit, presented themselves at the entrance to Kent's Cavern. They had left the highway and traversed the rude, rough, road which serves

as a path to that Mecca of geologists. At the portal to the gloomy cave the pair were confronted by a sepulchral-looking youth trundling a wheel-barrow, and in appearance instinctively recalling the gravedigger's clown in "Hamlet." One of the strangers said they wished to go into the cavern, but to this the youth, who was smirched from head to foot with the mire of a pre-adamite period, would not assent. They might, he said, enter as far as they could see, which was about arm's length, and if they wanted to go any farther they must pay three shillings and sixpence, and might take the candle. The visitor in the yachting suit put out his hand to take the flambeau (a tallow "dip" in a tin contrivance like a Dutch oven), but the wary youth with the barrow interposed with the remark that no one had permission to touch the candle except the manager, who wasn't there! Finding it impossible to make anything of this confusion of ingenious regulations, the two strangers laughed, lit their cigars, and walked away. Now, if Mr. Pengelly had known who had sought entrance to this treasure-house he would———. Well, well, where ignorance is bliss, &c.—*Whitehall Review*."

It will be observed that there is in the paragraph nothing like an assertion that one of the "two strangers" was the Prince of Wales; and it is surprising that anyone should be taken in by so evident a joke. B. C. H., however, instead of seeing a joke, converted the paragraph into a hoax, and became one of the victims which the writer had probably in his mind's eye. Not content with this, he has given the story some improving touches. His "boy in charge" was one of the workmen—a young fellow of three and twenty—who is very sorry, he tells me, that he never received the half-crown of which B. C. H. speaks.

A slip was also made in stating that "No one is permitted to enter this cave without a permit from W. Pengelly." No one has the right to give any such permit, and, accordingly, no one ever gives one. Visitors, unaccompanied by one of the two Superintendents of the Exploration, must be attended by the authorized Guide, and pay him the fixed fee he has a right to demand, but with which the Exploring Committee has nothing whatever to do.

The paragraph is well-known to have been a joke, written by a London Journalist, who was at Torquay in 1879, during the visit of the Prince of Wales. The article by B. C. H. will probably help to give his joke long life as an "historical fact!"

VII. DR. J. M. WINN ON BRIXHAM CAVERN, 1880.

Through the kindness of a friend, I lately became aware that there was in existence an octavo pamphlet of 36 pages,

entitled *The Collapse of Scientific Atheism*. By J. M. Winn, M.D., M.R.C.P., 1880. According to the title-page it was originally published in *The Journal of Psychological Medicine*, New Series, vol. vi., Part I. The Reprint is, with his permission, Inscribed to an "Ex-Commissioner in Lunacy for Scotland."

No one would probably accuse the author of being mealy-mouthed. Indeed, he not unfrequently does something more than "call a spade a spade;" and ever and anon he hurls remarkable verbal missiles at the heads of those whom he has selected as opponents, especially when, as he supposes, he finds them in error on matters of fact. It may be feared, however, that whilst perusing his philippicks, the reader will be apt to remember such old saws as "Those who live in glass houses shouldn't throw stones;" "The Crock shouldn't call the Kettle smutty," &c., &c.

Dr. Winn, after trying his pen on Dr. Tyndall and Professor Huxley, devotes rather more than a couple of pages to me in connection with Brixham Cavern and its teachings, and then proceeds to deal with Drs. Ferrier and Allman.

In offering a few Notes on what I may call *my* two pages of the pamphlet, I propose to quote a short passage from the author, to offer such remarks on it as seem called for; and to proceed thus to the end.

Subdued Tone of the Anthropologists in 1879:

QUOTATION I. "The subdued tone of the believers in the fabulous antiquity of man, at the last meeting of the British Association at Sheffield, was a strong contrast to the boldness and confidence with which Mr. Pengelly, F.R.S., delivered a sensational address on the previous occasion, at Glasgow, to a crowded audience." p. 21.

Dr. Winn is scarcely judicial in his mode of approaching or introducing the question of human antiquity, inasmuch as at the very outset he speaks of the prevalent belief of existing anthropologists as *fabulous*. If this epithet be justifiable there is no room for discussion, and the case need not detain the court.

I attended the meeting of the British Association at Sheffield, in 1879, and, I may add, every previous meeting of that body from 1856, inclusive, up to that time. During that period I have been tolerably familiar with the addresses, papers, and discussions at the meetings on Human Anti-

quity, and, as the Reports of the Association show, have taken no inconsiderable share in them; and I must be allowed to say that during the meeting at Sheffield, I was very far from feeling or believing that there were the least indications of the "subdued tone" of which the author speaks. Dr. Winn's name is not in the list of Members of the Association; he may not have been in the habit of attending any of the meetings; he appears never to have read a paper to any of its Sections; and he was perhaps not at Sheffield. It may be well, therefore, to state that at all previous meetings at which the subject has been discussed, almost every anthropologist, whilst stating the facts which led him to believe in a great human antiquity, has refrained from attempting to carry this antiquity back to pre-glacial, or even to inter-glacial times; that an advanced spirit, or two, has occasionally been known to break bounds, but has always received a "cold shoulder" or a "snubbing;" and that all this was decidedly changed at Sheffield. Not only was new evidence of very old British post-glacial man produced, not only was the excursion to the bone-cave at Cresswell Crags one of the most popular, but Mr. S. B. J. Skertchley, F.G.S., of the Geological Survey of Great Britain, who read to the Anthropological Department a paper on *Evidence of Palæolithic Man during the Glacial Period in East Anglia*, was, by a formal request from the Committee of the Geological Section, prevailed on to read it to that body also; and I have no hesitation in saying that no paper read to that Section, at that or at any previous meeting was ever more cordially received. Mr. Skertchley was publicly congratulated on his success; some, who in previous years were prominent in opposing the more advanced views, declared that their doubts were gone, whilst others observed a discreet silence.

When Dr. Winn speaks of "the boldness and confidence with which Mr. Pengelly delivered a sensational address on the previous occasion at Glasgow, to a crowded audience," he makes an error in either time or place. If it were on "the previous occasion," it was not at Glasgow, as the meeting "on the previous occasion"—1878—was held in Dublin; whilst, if it were "at Glasgow," it must have been in 1876—the date of the Glasgow meeting—and not "on the previous occasion." I, no doubt, read a Report on Kent's Cavern to the Geological Section, not only at Sheffield and "on the previous occasion," but on every "previous occasion" from 1865, inclusive, and sometimes "to a crowded audience." Reports are not usually sensational; but if one of mine must be so

termed, it must be that of 1879 at Sheffield, rather than that of 1878 in Dublin, or that of 1876 at Glasgow.

Brixham Cavern and Pre-glacial Man.

Quotation II. : "Mr. Pengelly was one of those who were selected by the Royal Society to examine the contents of the Brixham Cavern. It is therefore to be regretted that, on insufficient evidence, he should have availed himself of the influence of his position to imbue the public mind with the notion that the facts revealed by the exploration of the Brixham Cavern proved the existence of man in Devon during the pre-glacial, or at least inter-glacial period." p. 21.

Those "who were selected . . . to examine the contents of Brixham Cavern," were selected, not "by the Royal Society," as Dr. Winn states, but by the Geological Society; whilst the Royal Society, after the selection had been made, was asked by the Geological Society to assist with funds, and voted £200 for the purpose, or rather more than 75 per cent. of the whole cost.

As a matter of fact there was no selection in the case so far as I was concerned, as the Cavern was virtually in my hands before the Geological Society had heard of its existence (See *Trans. Devon. Asssoc.* vi. 782); and no Society or individual could have explored it, or have had anything to do with its exploration, without my concurrence. Moreover, being the only member of the "Selected" Committee residing in the neighbourhood, the superintendence of the exploration fell to me.

I challenge Dr. Winn to give Chapter and Verse for his statement that I have attempted "to imbue the public mind with the notion that the facts revealed by the exploration of the Brixham Cavern proved the existence of man in Devon during the pre-glacial, or at least inter-glacial period." In the meantime, I beg to assure his readers that the facts revealed by the exploration of Brixham Cavern led me to no such opinion, and that no statement such as Dr. Winn makes was ever uttered or written by me in connection with that Cavern. "It is therefore to be regretted, that, on insufficient evidence, he should have availed himself of the influence of his position to imbue the public mind with the notion that the facts" are other than they really are.

Comparative Talent, Enthusiasm, and Attainments.

QUOTATION III.: "Mr. Whitley, Vice President of the Royal Institution of Cornwall, whose talent, enthusiasm, and geological attainments are not inferior to those of Mr. Pengelly, has made most careful examinations of the Brixham Cavern, and his deductions are diametrically opposed to those of the former" [*sic*] "gentleman." p. 21.

I know nothing whatever as to what knowledge the author has of Mr. Whitley, but as Dr. Winn and I have never met, and never exchanged a single line—indeed, to the best of my recollection, I had never heard of his existence until the middle of May, 1880, when my attention was called to his pamphlet—I am at a loss to understand how or whence he has obtained data to enable him to pronounce so decidedly on the relative "talent, enthusiasm, and geological attainments" of Mr. Whitley and myself; nor do I know how far he is competent to give a verdict on such an inquest. So far, however, as I can perceive, it is not necessary to make any such enquiry, for it cannot be doubted that either of us having the opportunity, would have been found fully competent to make himself acquainted with the facts, and to make a satisfactory statement of them; whilst without such opportunity no one could have any acquaintance with the facts, save such as he obtained at second hand. In short, he could have no *knowledge* of the facts, and must be content with *belief* in the knowledge of some other person.

Such "careful examinations of the Brixham Cavern" as any one beyond the Committee may have made, were certainly made after all the deposits, with the specimens of every kind, had been removed; and certainly also without his being accompanied by any one having a personal knowledge of anything like *all* the facts. I feel it to be unnecessary to express an opinion respecting the value of such examinations, or deductions from them.

The Illustrated London News.

Quotation IV.: "The *Illustrated London News* for August 25th last, in the report of Mr. Pengelly's paper, confidently assures us that the "discovery and systematic exploration of a comparatively small virgin cavern on Windmill Hill at Brixham (in 1858), led to a sudden and complete revolution, for it was seen that, whatever were the facts elsewhere, there

had undoubtedly been found at Brixham flint implements, commingled with the remains of the mammoth and its companions, and in such a way as to render it impossible to doubt that man occupied Devonshire before the extinction of the mammoth." p. 23.

A reference to "the *Illustrated London News* for August 25th last," in a paper dated 1880, and published early in that year, refers presumably to August 1879. Nevertheless, there was no *Illustrated London News* published or dated on 25th August, 1879; nor have I been able to find any report of any paper by me, in the said journal, for either the 23rd or the 30th of August—the dates of publication in that year. There is a mistake somewhere.

The foregoing statements will suffice to show that the author has not taken much pains to get up his case, and that he cannot be congratulated on his success as an Advocate.

THE FONT IN CHRIST CHURCH, ILFRACOMBE.

BY MISS PRICE.

Communicated by the Rev. TREASURER HAWKER.

(Read at Totnes, July, 1880.)

WHEN the Devonshire Association met in Ilfracombe last year (1879), they were informed, at one of their meetings, that among the objects of interest in the neighbourhood was an ancient stone basin used as a font in Christ Church, Ilfracombe.

Many of the members paid a visit to inspect it, and expressed great interest in the ancient relic.

It has been suggested that some account of it would be acceptable. It is to be regretted that so little of its history can be traced.

It was placed in the church by Mr. Thorne, the old gentleman who built the church in 1844. It stood on a cumbersome wooden pedestal, with a conical-shaped cover, which completely concealed it from view. Thus hidden, it excited for many years neither comment nor curiosity.

When the church was enlarged, the architect, Mr. Gould, of Barnstaple, directed attention to its value, and gave it as his opinion it was an ancient Piscina, at least 600 years old. Since then others have been to see it; and one authority declared it was more likely to have belonged to the days of Imperial Rome, and have been used for grinding corn.

This idea has been somewhat confirmed by seeing in the Roman collection, in the old Castle Museum at Newcastle-on-Tyne, some stone vessels almost identical in size and shape, and which were undoubtedly Roman querns or corn-mills.

From the accompanying sketch it will be perceived that the font is semi-globular in form, and stretches thirteen inches across, and is seven inches deep. The stone is of a peculiarly hard nature, and the massive heavy bowl is grooved out of one block.

On two sides are handles, cut out of the same stone, with a rude attempt at ornamentation.

There are no carvings on it; nor can any figures or initials be deciphered by which its date can be fixed. There was a hole in the centre (now filled up), which would have been necessary for the Roman quern, and equally so for the holy water of the Piscina.

How it came into the possession of the aforesaid Mr. Thorne is unknown. He died many years since, and his family, who have been questioned, know nothing about it. He was noted in his day as a frequenter of sales, in order to pick up odds and ends. When he placed this bowl in the church for a font, he is said to have expressed great satisfaction at its having come into such good use.

It has been conjectured that it is probably a relic from the St. Nicholas Chapel, on the old Lantern Hill, and held the holy water in some little niche there, in those remote centuries when Ilfracombe was somewhat of an important port, and sent its representatives to Councils of Shipping, and supplied sailors and ships for foreign expeditions (1344). One can picture the brave sailors of those days climbing the rugged hill, and passing and repassing it in the little chapel where they went to pray to their patron saint—St. Nicholas—before spreading their sails to breast the waves of the western sea.

This theory in no way invalidates the supposition of its having been previously a Roman corn-mill. Wishing for further information, inquiry was made if there was anything like it among the Roman remains in the Blackmore Museum, at Salisbury.

Mr. Blackmore, in his reply, said it was unlike any of the Roman quern or corn-mills with which he was acquainted, but a somewhat similar vessel is figured in *Isca Silurum*, pl. xlv., fig. 6.

"There is also," he adds, "in the Blackmore Museum a broken stone mortar, which corresponds with the one in *Isca Silurum*, and is not probably more than three centuries old."

The members of the Devonshire Association who saw the font last year were divided in their opinion as to its age. Some thought it only mediæval.

One member suggested whether it might not be a relic of the Ancient Britons—a sacred vessel of the Druids. We know that Devonshire, or Dyvneint (the "land of valleys and brooks," in their expressive language), was the kingdom of the heroic Prince Arthur, so renowned in story and song, and was the scene of many stirring events. The Britons, driven

into the west by the Romans, held sway here for centuries after other parts of the island had succumbed to their powerful conquerors; and the Druids might, in some of their mysterious rites, have used this identical vessel. In any case, it has now found a place of rest, and a haven of peace, after all its wanderings.

No doubt there are other stone basins scattered about the county. Surely some record of them should be made. I am informed by Mr. Townsend Hall, of Pilton, that Mr. Chichester, of Hall, has one in his possession. Are there any others known? North Devon is not rich in Roman remains, and it behoves us to make much of what we have.

Mention is made, in Rowe's *Perambulation of Dartmoor*, of a semi-circular stone, about 18 inches in diameter, with a hole in the centre, found on Dartmoor, and supposed to be a primitive quern or hand-mill.

It may be as well to record that another ancient stone bowl was formerly in the possession of a gentleman in Ilfracombe, similar in size, but slightly different in shape, to the one we have been describing.

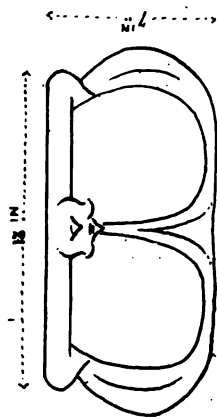
This gentleman, Captain Thorpe, bought it, some ten or twelve years ago for a mere trifle, at the sale of an eccentric old lady living near the quay. It afterwards got broken in some way, but as the gentleman has long since left the neighbourhood its ultimate fate is not known.

At the same sale Captain Thorpe also bought an old carved wooden drinking-cup, a supposed holy vessel, which he discovered lying about the yard, and which the quick eye of the connoisseur detected at once. The words "*Sacra Vasa*" were found carved upon it; and no doubt both it and the stone vessel had formerly belonged to the oratory on Lantern Hill.

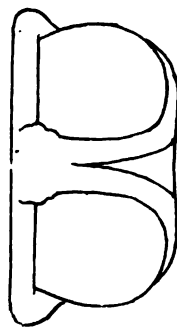
Ilfracombe has been a rich store-house of treasures for lovers of the quaint and curious. Many rare bits of carving have been picked up in its cottages and among the farm-houses on the coast; and marvellous works of art, of most wonderful device and workmanship, have been discovered in the fisherman's cabin, or the sea-captain's best parlour.

But nearly all have yielded to the temptation of the visitor's gold, and little is left to repay the most ardent research. The town was thoroughly ransacked in the late fashionable craze for old china, and despoiled of all it possessed.

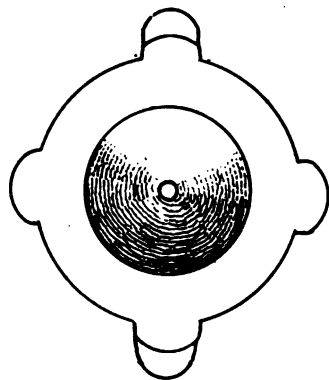
ANCIENT BOWL USED AS A FONT IN CHRIST CHURCH, ILFRACOMBE. 1880.



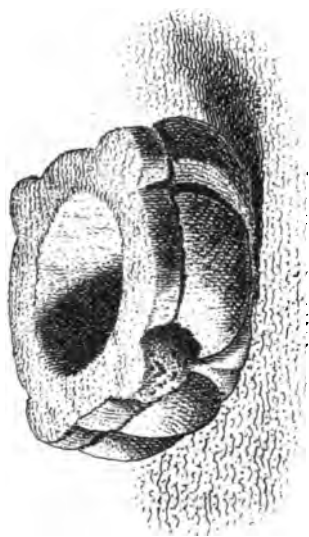
FRONT.



SIDE.



PLAN.



SKETCH.

LIST OF MEMBERS.

* Indicates Life Members.

† Indicates Honorary Members.

‡ Indicates Corresponding Members.

The Names of Members of the Council are printed in small capitals.
Notice of Changes of Residence and of Decease of Members should be sent to the
General Secretary, Rev. W. Harpley, Clayhanger Rectory, Tiverton.

Year of
Election.

- 1879* Acland, H. W. D., M.A., M.D., LL.D., F.R.S., F.R.G.S. (PRESIDENT),
Broad Street, Oxford.
- 1880 Acland, Rev. Preb., M.A., Broadclyst, Exeter.
- 1875 Adams, George, Buckyett, Little Hempston, Totnes.
- 1875 Adams, James, M.D., Ashburton.
- 1877 Adams, James, jun., Kingsbridge.
- 1872† Adams, John Couch, M.A., D.C.L., F.R.S., F.R.A.S., Director of
Observatory and Lowndean Professor of Astronomy and
Geometry in the University of Cambridge, The Obser-
vatory, Cambridge.
- 1880 Adams, S. P., Bridgetown, Totnes.
- 1878 Alexander, James, M.D., Paignton.
- 1874 Alsop, R., Teignmouth Bank, Teignmouth.
- 1877 Amery, Jasper, Glens, Kingsbridge.
- 1869 AMERY, J. S., Druid, Ashburton.
- 1869 AMERY, P. F. S., Druid, Ashburton.
- 1875* ANDREW, T., F.G.S., Southernhay, Exeter.
- 1877 Andrews, R., Modbury.
- 1880 Anthony, Rev. F. Evans, Woodland Terrace, Plymouth.
- 1863 APPLETON, EDWARD, F.I.B.A., 1, Vaughan Parade, Torquay.
- 1880 Armstrong, L., St. Bernard's, Stanbury, Newton Abbot.
- 1870 Arnold, G., Dolton.
- 1877 Arthur, Edward, Mounts, R.S.O., South Devon.
- 1868 Ashley, J., Honiton.
- 1874 Ayerst, J. S. A., M.D., 2, Belgrave Terrace, Torquay.
- 1880 BAKER, A. DE WINTER, L.R.C.P., M.R.C.S. (HON. LOCAL
TREASURER ELECT), 2, Lawn Terrace, Dawlish.
- 1878 BAKER, SIR SAMUEL WHITE, M.A., F.R.S., F.R.G.S., Sandford
Orleigh, Newton Abbot.

- 1880 Baker, Captain, Gatcombe, near Totnes.
 1877 Balkwill, B., Devon and Cornwall Bank, Kingsbridge.
 1877 Balkwill, R. C., Park, Kingsbridge.
 1871 Bangham, Joseph, Torrington.
 1878 Baring-Gould, Rev. S., M.A., Lew Trenchard, Lewdown.
 1862 Barnes, Rev. Preb., M.A., The Vicarage, Heavitree, Exeter.
 1879 BARNETT, C. G., Ilfracombe.
 1879 Baron, Rev. J., D.D., F.S.A., Rectory, Upton Scudamore, Warminster, Wilts.
 1880 Bartholomew, Rev. R., Harberton Vicarage, Totnes.
 1877 Bartlett, Rev. J. M., Manor House, Ludbrooke, Modbury, Ivybridge.
 1876 Bastard, B. J. P., Kitley, Yealmpton, South Devon.
 1862 BATE, C. SPENCE, F.R.S., &c., 8, Mulgrave Place, Plymouth.
 1872 Bate, James J. R., Bampton Street, Tiverton.
 1873 Batten, J. Hallet, F.R.G.S., M.B.A.S., 2, Manston Terrace, Exeter.
 1866 Bayly, John, Seven Trees, Plymouth.
 1871* Bayly, Robert, Torr Grove, Plymouth.
 1876 Beal, Rev. S., B.A., Professor of Chinese, University College, London, Rectory, Falstone, Northumberland.
 1876 Beatty, W., Buckfastleigh.
 1875 Bedford, Admiral E. L., R.N., Fairlawn, Paignton.
 1878 Benbow, V., Torbay Mount, Paignton.
 1875 Bennett, C., 5, Victoria Terrace, Mount Radford, Exeter.
 1877 Bennett, E. Gasking, Woodland Terrace, Plymouth.
 1877 Berry, J., 18, Belgrave Terrace, Torquay.
 1879 Berthon, Miss, Southcombe, Paignton.
 1876 Bickford, J., Bank, Ashburton.
 1880 Birch, Rev. W. M., M.A., Vicarage, Ashburton.
 1879 Birkmyer, J., 13, Lower Terrace, Mount Radford, Exeter.
 1876 Bishop, E., 4, Lancaster Terrace, Regent's Park, London, N.W.
 1877 Blackler, J., Kingsbridge.
 1878 Blackmore, Rev. R., M.A., Probus, Cornwall.
 1872 Borlase, W. C., F.S.A., M.P., Laregan, Penzance.
 1876 Bovey, Edward, Baddaford, Staverton, Buckfastleigh.
 1880 Bowden, E., Rosabelle, Totnes.
 1873 Bowring, L. B., C.S.I., Lavrockbeare, Torquay.
 1874 Bowring, Lady, 7, Baring Crescent, Exeter.
 1876† Bray, Mrs., 40, Brompton Crescent, South Kensington.
 1869 Brendon, William, George Street, Plymouth.
 1872 Brent, F., 19, Clarendon Place, Plymouth.
 1873 Brewin, R., Bearsden, Ide, Exeter.
 1872 Bridges, W. T., D.C.L., Torwood, Torquay.
 1878 Bridgman, G. Soudon, Bampton, Torquay.
 1870 Briggs, T. R. A., F.L.S., 4, Richmond Villas, Saltash Road, Plymouth.
 1872 Brodrick, W., Littlehill, Chudleigh.
 1879 Brown, D., M.D., Pen y Graig, Kingskerswell.

- 1878 Brown, H., Greystone, Teignmouth.
 1878 Brown, James, Goodrington House, Paignton.
 1876 Brown, M. G., Stanmore House, Dawlish.
 1879*Bryce, J. B., Bystock, Exmouth.
 1880 Bryett, T., Redworth, Totnes.
 1872 Buckingham, W., 12, Southernhay, Exeter.
 1874 Bulteel, C., F.R.C.S., Durnford Street, Stonehouse.
 1871 Burch, Arthur, 5, Baring Crescent, Exeter.
 1873*Burdett-Coutts, Right Hon. Baroness, 1, Stratton Street, Piccadilly, London.
 1879 Butcher, L. G., Manor House, Ilfracombe.

 1862 Cann, William, 9, Southernhay, Exeter.
 1880 Cape, J. T., 62, High Street, Totnes.
 1874 Carew, W. H. Pole, Antony, Torpoint.
 1866*Carpenter-Garnier, J., M.P., Mount Tavy, Tavistock.
 1880 Carter, H. J., F.R.S., H.M.R.A.S., The Cottage, Budleigh Salterton.
 1880 Carter, S. S., Noland Park, South Brent, Ivybridge.
 1878 Cary, R. S. S., Tor Abbey, Torquay.
 1880 Cary, Stanley E., J.P., Follaton House, Totnes.
 1879 Cater, S., North Devon Place, Tavistock Road, Plymouth.
 1866*CHAMPERNOWNE, A., M.A., F.G.S., Dartington House, Totnes.
 1876 Champernowne, Rev. R., M.A., Dartington, Totnes.
 1866 CHANTER, J. R., Fort Hill, Barnstaple.
 1877 Chaplin, R. P., Earlham, Torquay.
 1871 Charlewood, Admiral E. P., R.N., Porthill, Northam, Bideford.
 1880 Chaster, J. N., West Hill House, Totnes.
 1880 Chaster, J. W., West Hill House, Totnes.
 1876*Chatto, W. P., The Daison, St. Mary Church, Torquay.
 1869*Clark, R. A., Wentworth, Torquay.
 1871 Clements, Rev. H. G. J., M.A., Vicarage, Sidmouth.
 1872 Clifford, Col. Morgan, St. Ronan's, Torquay.
 1873 Clifford, Right Hon. Lord, Ugbrooke, Chudleigh.
 1875 Clinton, Right Hon. Lord, Heanton Satchville, Beaford.
 1874 Coffin, J. R. Pine, Portledge, Bideford.
 1870 Coffin, T., 81, Queen's Crescent, Haverstock Hill, London, N.W.
 1868*COLERIDGE, Right Hon. Lord, M.A., 1, Sussex Square, London.
 1873 Coleridge, W. R., Salston, Ottery St. Mary.
 1879 Collier, Arthur Bevan, Carthamartha, Callington.
 1876 COLLIER, Right Hon. Sir R., M.A., Bigod's Hall, Dunmoor, Essex.
 1866 COLLIER, W. F., Woodtown, Horrabridge.
 1880 Condry, W., High Street, Totnes.
 1871 Cook, Rev. Precentor, M.A., The Close, Exeter.
 1879 Cooke, L. R., Lauriston Hall, Torquay.
 1880 Cornish-Bowden, F. J., Blackhall House, Ivybridge, S. Devon.
 1877 Cornish, T. F., Stancombe, Kingsbridge.

- 1867 COTTON, R. W., Woodleigh, Newton Abbot.
 1866 COTTON, W., F.S.A., The Close, Exeter.
 1878 Cranford, R., *Directory Office*, Dartmouth.
 1877 Crimp, W. A., Kingsbridge.
 1880 CROFT, C. W. (HON. LOCAL TREASURER), Devon and Cornwall Bank, Totnes.
 1877 Cubitt, W., J.P., Fallapit Mounts, Kingsbridge.
 1880 Curnow, J., Bridgetown, Totnes.

 1875 David, Rev. W., Colleton Crescent, Exeter.
 1875 DAVIDSON, J. B., Secktor House, Axminster.
 1877 Davies, W. Kingsbridge.
 1880 Davis, J., High Street, Totnes.
 1878 Davson, F. A., M.D., Dartmouth.
 1878 Davy, A. J., Fleet Street, Torquay.
 1880 Dawkins, Admiral, Maisonette, Stoke Gabriel, Totnes.
 1870 De Larue, P. F., M.R.C.S., 40, Ker Street, Devonport.
 1879 Dennis, J. C., Ilfracombe.
 1873 DEVON, Right Hon. the Earl of, Powderham Castle, Exeter.
 1880 Distin, A. S., High Street, Totnes.
 1862 Divett, John, M.A., Bovey Tracey.
 1867 DOE, G., Castle Street, Great Torrington.
 1880 Doveton, F. B., Bradridge House, Diptford, Ivybridge.
 1869*Douglas, Rev. R., M.A., Manaton, Moretonhampstead.
 1873*Dowie, J. M., Wetstones, West Kirby, Birkenhead.
 1876 DOWNES, Rev. W., B.A., F.G.S., Kentisbeare, Collumpton.
 1880 Drake, Sir W. R., 12, Prince's Gardens, South Kensington, London.
 1878 Dredge, Rev. J. Ingle, Buckland Brewer, Bideford.
 1878 Drummond, E., M.D., Belgrave, Sidmouth.
 1877 Dumbleton, Rev. E. N., M.A., Exeter.
 1879 Dymond, A. H., Castle Chambers, Exeter.
 1871 Dymond, F. W., 3, Manston Terrace, Exeter.
 1872 DYMOND, R., F.S.A., Bampfylde House, Exeter.

 1877 Eady, Mrs., Coombe Royal, Kingsbridge.
 1876 EARLE, Venerable Archdeacon, West Alvington, Kingsbridge.
 1878 Edgelow, F., Hermosa, Teignmouth.
 1880 Edmonds, T. H., Bridgetown, Totnes.
 1879 Edmonds, Rev. W. J., M.A., High Bray Rectory, Southmolton.
 1873 Ellacombe, Rev. H. T., F.S.A., M.A., Clyst St. George.
 1877 Elliot, J., Tresillian, Kingsbridge.
 1877 Elliot, R. L., Tresillian, Kingsbridge.
 1878 ELWORTHY, F. T., Foxdown, Wellington, Somersetshire.
 1869*Evans, J. F.R.S., F.S.A., F.G.S., Nash Mills, Hemel Hempstead, Herts.
 1877 Evans, J. L., Moreton House, Tyndall's Park, Bristol.
 1880 Evans, Parker N., 23, Pembroke Road, Clifton, Bristol.

- 1880 Everett, Rev. A. J., M.A., Berry Pomeroy, Totnes.
 1871*EXETER, Right Rev. the Lord Bishop of, The Palace, Exeter.
 1869*Farley, H. W., C.E., Devon County Surveyor's Office, Post Office Chambers, Queen Street, Exeter.
 1879 Featherstone, Rev. S., M.A., Whitchurch Vicarage, Tavistock.
 1864 Finch, T., M.D., F.R.A.S., Westville, St. Mary Church, Torquay.
 1875 FIRTH, F. H., Cator Court, Ashburton.
 1873 Fisher, Edward, Blackmore Hall, Sidmouth.
 1875 Fisher, G., High Street, Torrington.
 1876 Fisher, Thomas, M.D., Bilberry Hill, Buckfastleigh.
 1880 Fixsen, Rev. J. F., M.A., Ugborough Vicarage, Ivybridge.
 1876 Fleming, J., Bigadon, Buckfastleigh.
 1876 Foaden, J. H., Ashburton.
 1876 Follett, C. J., B.C.L., Polsloe House, Exeter.
 1867 Fortescue, Right Hon. Earl, Castle Hill, Southmolton.
 1867*Foster, Rev. J. P., M.A., The Vicarage, Mirfield, Normanton, Yorkshire.
 1878 Foster, Samuel, Abergeldie, Torquay.
 1876 Fouracre, J. T., Chapel Street, Stonehouse, Plymouth.
 1875 Fowler, C., Villa Mentone, Torre, Torquay.
 1876*Fowler, Rev. W. W., Repton, Burton-on-Trent.
 1876 Fox, Charles, Kingsbridge.
 1877 Fox, George, Kingsbridge.
 1863 Fox, S. B., 7, Southernhay, Exeter.
 1880 French, W., North Tawton.
 1874†Froude, J. A., M.A., 5, Onslow Gardens, London.
 1876 Fulford, F. D., Exmouth.
 1880 Furneaux, J., Hill Crest, Buckfastleigh.
 1880 Furneaux, J. H., Hill Crest, Buckfastleigh.
 1880 Furneaux, W. C., Hill Crest, Buckfastleigh.
 1872 Galton, J. C., M.A., F.L.S., New University Club, St. James's Street, London, W.
 1862 GAMLEN, W. H., Brampford Speke, Exeter.
 1877 Gay, W. R., Hill Side, Kingsbridge.
 1876*Gaye, Henry S., M.D., 3, Courtenay Terrace, Newton Abbot.
 1872*Geare, J. G., Exeter.
 1871*GERVIS, W. S., M.D., F.G.S., Ashburton.
 1872 Gidley, Bartholomew C., M.A., Hoopern House, Exeter.
 1865 GILL, H. S., J.P., Tiverton.
 1880 Gill, Rev. A., Vicarage, Harbertonford, Totnes.
 1876 Gillow, W., Stapleton, Torquay.
 1875 Glubb, P. B., Potacre Street, Torrington.
 1877*Glyde, E. E., F.M.S., Kirkham, Babbacombe, Torquay.
 1868*Goldamid, Sir Julian, Bart., M.A., M.P., 105, Piccadilly, London, W.

- 1876 Goodrick, G., 11, George Road, Edgbaston, Birmingham.
 1878 GREGORY, A., Bank, Paignton.
 1878 Gregory, Rev. E. I., M.A., Halberton Vicarage, Tiverton.
 1877 Gretton, Rev. W. H., M.A., Alvanley, Torquay.
 1875 Groser, A., 3, North Devon Place, Plymouth.
 1873 Grundy, T., Beetlands, Sidmouth.
 1878 Grundy, Rev. T. R., Elbury Lodge, Newton Abbot.
 1876 Guenett, Rev. J. F., Point-in-View, Lympstone, Exeter.
 1875 Guille, Rev. G. de Carteret, Rectory, Little Torrington.
 1874 Gulson, J. R., East Cliff, Teignmouth.
 1873*Guyer, J. B., F.C.S., 1, Lisburne Cottages, Torquay.

 1880 Hacker, S., Newton Abbot.
 1870 Haddy, Rev. J. P., 8, Home Park, Stoke, Devonport.
 1880 Hains, J., J.P., Bridgetown, Totnes.
 1880 Hains, L., 2, Fore Street, Totnes.
 1862 Haldon, Right Hon. Lord, Haldon House, Exeter.
 1867*HALL, TOWNSEND M., F.G.S., Pilton, Barnstaple.
 1873*Halliday, W. H., M.A., J.P., Glenthorn, Lynmouth, Barnstaple.
 1862 HAMILTON, A. H. A., M.A., Fairfield Lodge, Exeter.
 1880 Hamlyn, J., Bossell Park, Buckfastleigh.
 1880 Hamlyn, John, Toll Marsh, Buckfastleigh.
 1880 Hamlyn, Joseph, Park View, Buckfastleigh.
 1880 Hamlyn, W., Croppin's Park, Buckfastleigh.
 1878 Hamlyn, W. B., 4, Abbey Crescent, Torquay.
 1873*Hanbury, S., Bishopstowe, Torquay.
 1880 Hannaford, Theodore, High Street, Totnes.
 1870 Harding, Col., F.G.S., Upcot House, Pilton, Barnstaple.
 1868 Harper, J., L.R.C.P., Bear Street, Barnstaple.
 1874 Harpley, R. B., West Hartlepool.
 1862 HARPLEY, Rev. W., M.A., F.C.P.S. (HON. GENERAL SECRETARY),
 Clayhanger Rectory, Tiverton.
 1880 Harris, Edward, Albany House, Totnes.
 1878 Harris, Rev. E., M.A., Grammar School, Exeter.
 1877 Harris, Rev. S. G., M.A., Highweek, Newton Abbot.
 1873*Harvey, J. T., Aberfeldie, Torquay.
 1875 Hatt-Cook, Herbert, Hartford Hall, Cheshire.
 1869 HAWKER, Rev. Treasurer, M.A., Berryнарbor Rectory, Ilfracombe.
 1880 Hayman, B. W., High Street, Totnes.
 1869 Hayne, C. Seale, Kingswear Castle, Dartmouth.
 1872 Hayward, P., Cathedral Yard, Exeter.
 1862 Header, G. E., Chelston Cottage, Cockington, Torquay.
 1865 Header, W., Rocombe, Torquay.
 1880 Heath, J., 1, Fore Street, Totnes.
 1880 Heath, T., 1, Fore Street, Totnes.
 1868*Heberden, Rev. W., M.A., 14, Gloucester Place, Portman Square, London.

- 1875 Hedgeland, Rev. Preb., M.A., Penzance.
 1871 Heineken, N. S., Sidmouth.
 1880 Henley, Rev. T. C., Kirkby Malham Vicarage, Bell Busk,
 Leeds.
 1880 Hewitson, T., Wear, Staverton, Buckfastleigh.
 1876 Hill, H. S., *Cornish Telegraph*, Penzance.
 1872 Hill, J., J.P., Moretonhampstead, Exeter.
 1862 Hine, J., F.R.I.B.A., 7, Mulgrave Place, Plymouth.
 1880 Hingston, A., St. Leonard's, Bridgetown, Totnes.
 1877 Hingston, P. O., Kingsbridge.
 1869 Hingston, R., Dartmouth.
 1873 Hodge, B. T., M.D., High Street, Sidmouth.
 1867 HODGSON, W. B., Professor, LL.D. (PRESIDENT ELECT), Bqualy
 Tower, Colinton, Scotland.
 1879 Hole, T., B.A., Ilfracombe.
 1880 Holland, Major-General H. W., Bowden House, Totnes.
 1880 Holman, W., Bridgetown, Totnes.
 1877 Holt, Major, Ogbear Hall, Holsworthy, Devon.
 1875 Holwill, Frederick, South Street, Torrington.
 1872 Hooper, B., Bournbrook, Torquay.
 1878 Hooper, J., Kingsbridge.
 1879 Hooper, S., Hatherleigh.
 1872 Horniman, W. H., Coombe Cliff House, Croydon, Surrey.
 1871 Hounsell, H. S., M.D., Woodlands, Torquay.
 1880 Hughes, Rev. J. B., Staverton Vicarage, Totnes.
 1868*HUNT, A. R., M.A., F.G.S., President of the Torquay Natural
 History Society, Southwood, Torquay.
 1878 Hunton, T., B.A., Bronshill, Torquay.
 1877 HURRELL, A. W., B.A., The Knowle, Kingsbridge.
 1877 Hurrell, Henry, LL.B., 1, New Court, Middle Temple,
 London.
 1876 HURRELL, J. S., Buttsville, Kingsbridge.
 1876 Hurrell, R., The Knowle, Kingsbridge.
 1873 Hutchins, Rev. H., M.A., The Clintons, Teignmouth.
 1868 HUTCHINSON, P. O., Sidmouth.

 1877 Ilbert, Rev. P. A., M.A., Thurstlestone Rectory, Kingsbridge.
 1877 Ilbert, W. R., Bowringsleigh, Kingsbridge.
 1869 Inskip, Rev. R. M., M.A., B.N., C.B., 1, Houndiscombe Place,
 Plymouth.

 1877 Jackson, G., F.R.C.S., St. George's Terrace, Plymouth.
 1877 Jane, Rev. J., Upton Pyne Rectory, Exeter.
 1877 Jarvis, W. A., Bolberry, Kingsbridge.
 1880 Johns, Rev. J., B.A., Dart Villas, Totnes.
 1862 JONES, WINSLOW, Office of Messrs. Follett and Co., Cathedral
 Close, Exeter.
 1871 JORDAN, W. R. H., Bitton Street, Teignmouth.

- 1874 KARKEEK, P. Q., 1, Matlock Terrace, Torquay.
 1880*Keeling, F., St. Mary's Terrace, Colchester.
 1880 Keen, B., High Street, Totnes.
 1880 Kelland, J., M.A., The Mansion, Totnes.
 1879*Kelland, W. H., 110, Jermyn St., Piccadilly, London, S.W.
 1877 Kellock, T. C., Totnes.
 1872*Kennaway, Sir John H., Bart., M.A., M.P., Escot, Ottery St. Mary.
 1880 King, C. R. B., 35, Oakley Square, London, N.W.
 1878 Kitson, R., M.A., Hengrave, Torquay.
 1865*Kitson, W. H., Hemsworth, Barton Road, Torre, Torquay.
 1880 Knight, S., F.R.I.B.A., 24, Cornhill, London, E.C.

 1869*Laidley, Rev. W., M.A., Ware.
 1879 Lake, R., Chairman of Local Board of Health, Ilfracombe.
 1871 LAKK, W. C., M.D., F.M.S., 2, West Cliff Terrace, Teignmouth.
 1873 Lavers, W., Upton Leigh, Torre, Torquay.
 1871 Lee, Godfrey Robert, Timaru Cottage, Teignmouth.
 1872 LEE, J. E., F.G.S., F.S.A., Villa Syracusa, Torquay.
 1873 Lethaby, R., Market Place, Sidmouth.
 1878 Lewis, J., Winner Street, Paignton.
 1877 Lidstone, J., Kingsbridge.
 1880 Lilly, Rev. P., Collaton Vicarage, Paignton.
 1872 Linford, W., Elstow, Old Tiverton Road, Exeter.
 1872 Lloyd, Horace G., 9, Baring Place, Mount Radford, Exeter.
 1879 Loosemore, R. F., Tiverton.
 1880 Loveband, J. E., Weston House, Totnes.
 1873 Loveband, M. R., Torrington.
 1879 Loveband, Rev. W. C., M.A., West Down Vicarage, Ilfracombe.
 1877 Luscombe, John, Alvington, Torquay.
 1877 Luskey, J., Vine Terrace, Kingsbridge.
 1869 Luttrell, G. F., Dunster Castle, Somerset.
 1863*Lyte, F. Maxwell, F.C.S., Cotford, Oak-hill Road, Putney, London.

 1865 Mackenzie, F., F.R.C.S., Tiverton.
 1880 Mallock, A., Brampford Speke, Exeter.
 1877 Mallock, R., Cockington Court, Torquay.
 1873 Marsh Dunn, R. M., Carlton Lodge, Teignmouth.
 1879 Marshall, Miss S. (Care of Mrs. Miller, 30, Girdler Road, Brook Green, London).
 1871 Marshall, W., 12, Cornwall Street, Plymouth.
 1871*MARTIN, JOHN MAY, C.E., F.M.S., Lower Musgrave House, Exeter.
 1870 May, J., M.R.C.S., J.P., 1, Nelson Villas, Stoke, Devonport.
 1880 May, J. M., Dart Villas, Totnes.
 1880 Maye, T., South Ford, Staverton, Totnes.
 1867*Merrifield, J., LL.D., F.R.A.S., Gascoigne Place, Plymouth.

- 1880 Michelmores, H., 11, Higher Summerlands, Exeter.
 1880 Michelmores, J., Berry House, Totnes.
 1879 Milligan, J., The Library, Ilfracombe.
 1870 Mogg, W., Stafford's Hill, Devonport.
 1873 Mogridge, Robert Palk, Withycombe House, Wiveliscombe,
 Somerset.
 1862 Moore, W. F., The Friary, Plymouth.
 1872 Mortimer, W., 14, Bedford Circus, Exeter.
 1880 Mortimore, A. E., Fore Street, Totnes.
 1880 Mortimore, T. C., Fore Street, Totnes.
 1874*Mount Edgcumbe, Right Hon. Earl of, Mount Edgcumbe,
 Devonport.

 1864 Nankivell, C. B., M.D., Layton House, Torquay.
 1880 Newton, H. Cecil, 24, Finborough Road, London, S.W.
 1876 Nosworthy, W., Ford, Manaton, Moretonhampstead.

 1862 ORMEROD, G. W., M.A., F.G.S., F.M.S., Woodway, Teignmouth.

 1872 Paige-Browne, J. B., M.A., Great Englebourne, Harberton,
 South Devon.
 1869*Pannell, C., F.G.S., Walton Lodge, Torquay.
 1862 PARFITT, EDWARD, Devon and Exeter Institution, Exeter.
 1872 Parker, C.E., 13, Scarborough Terrace, Torquay.
 1872†Peach, Charles W., A.S.L., 30, Haddington Place, Leith Walk,
 Edinburgh.
 1877 Pearce, F. D., Brook House, Kingsbridge.
 1876 Pearce, W. E. G., M.D., 24, Bessborough Gardens, London, S.W.
 1874 Pearce, W. H., M.D., 1, Alfred Place, Plymouth.
 1872*Peek, Sir H. W., Bart., M.P., Rousdon, Lyme, Dorset.
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 1880 Pike, A., Clifton Villa, Bridgetown, Totnes.
 1876 Pitt-Lewis, G., 1, Elm Court, Temple, London, E.C.
 1879 Plymouth Free Library.
 1880 Poda, T. D., Slade, Ivybridge.
 1862 Pollard, W., M.R.C.S., Southland House, Torquay.
 1868 Porter, W., M.A., Hembury Fort, Honiton.
 1878*Powell, W., M.B., F.R.C.S., Hill Garden, Torquay.
 1876 Power, Rev. J., M.A., Altarnun Vicarage, Launceston.
 1876 Powning, Rev. J., B.D., Totnes.
 1875 Price, W. E., South Street, Torrington.
 1879 Price, Right Rev. Bishop, M.A., Hoone Villa, Ilfracombe.
 1878 Pring, James H., M.D., Elmfield, Taunton.
 1874 Proctor, W., Elmhurst, Torquay.

- 1867 Prowse, A. P., Mannamead, Plymouth.
 1878 Pulliblack, Rev. J., M.A., St. Mary's Lane, Walton-on-the-Hill,
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 1880 Punchard, W. H., Springville, Totnes.
 1862 Pycroft, G., M.B.C.S., F.G.S., Kenton, Exeter.

 1880 Raby, J., High Street, Totnes.
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 1868*Radford, W. T., M.B., F.R.A.S., Sidmount, Sidmouth.
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 1872 Reichel, Rev. Oswald J., B.C.L., Sparsholt, Wantage, Berks.
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 1869 Ridgway, Lieut.-Colonel, Sheplegh Court, Blackawton, South
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 1879 Robbins, W. M., High Street, Ilfracombe.
 1877 Roberts, L., F.G.S., Kennessee, Maghull, Lancashire.
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 1880 Roe, J., Rectory, Totnes.
 1870 Rolston, G. T., M.B.C.S., Stoke, Devonport.
 1878 Rooker, W. S., Bideford.
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 1865 Scott, W. B., Chudleigh.
 1876 Sharman, Rev. W., 20, Headlands Park, Plymouth.
 1879 Shelly, J., 20, Princess Square, Plymouth.
 1868 Sidmouth, Right Hon. Viscount, Upottery Manor, Honiton.
 1876 Sinclair, J. B., Southborough, Tunbridge Wells.
 1869*Sivewright, J., The Grove, Torquay.
 1878 Slade, S. H., Simla, Goodrington, Paignton.
 1878 SLADE-KING, E. J., M.D., L. San. Sc., Croft Side, Ilfracombe.
 1879 SLADE-KING, Mrs., Croft Side, Ilfracombe.

- 1874 Smith, E., F.C.S., Strand, Torquay.
 1879 Smith, Rev. Preb., M.A., Crediton.
 1873* Sole, Major W. H., Hareston, Torquay.
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 1879 Spencer, Rev. T., The Presbytery, Ilfracombe.
 1864 Spragge, F. H., The Quarry, Paignton.
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 1878 Square, W., F.R.C.S., Plymouth.
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 1868 STEBBING, Rev. T. R. R., M.A., Warberry House, Bishopsdown
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 1876 Steele, H., Place, Ashburton.
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 1876 Stentiford, C. D., *Western Morning News* Office, Plymouth.
 1872* Stewart-Savile, Rev. F. A., M.A., Ardmore, Torquay.
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 1875* Sullivan, Miss, Broom House, Fulham.
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 1880 Symons, P., jun., Paradise, Totnes.

 1876 Tanner, E. Fearnley, Hawson Court, Buckfastleigh.
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 1876* Templer, J. G. J., M.A., Lindridge, Teignmouth.
 1877 Thomas, Henry Drew, Dix's Field, Exeter.
 1872 Thomas, J. L., New Hayes, St. Thomas, Exeter.
 1872 Thomson, Spencer, M.D., Ashton, Torquay.
 1868 Thornton, Rev. J. H., B.A., North Bovey Rectory, Moreton-
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- 1876 TUCKER, R. C., Ashburton.
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 1878 Wallis, A. J., Totnes.
 1880 Walker, W. H., Princess Place, Plymouth.
 1880 Walrond, H., Dulford House, Cullompton.
 1878 Warner, Rev. G. T., M.A., The College, Newton Abbot.
 1878 Watkins, Rev. W., Bridgetown, Totnes.
 1880 Watson, R. H., J.P., Brook, Totnes.
 1880 Watts, F., Newton Abbot.
 1880 Watts, H. E., Roundham House, Paignton.
 1880 Watts, Rev. J., Priory Cottage, Totnes.
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 1870* Were, T. K., M.A., Cotlands, Sidmouth.
 1866* Weymouth, R. F., D. LIT., M.A., Mill Hill, Middlesex. N.W.
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 1880 White, Rev. F. Gilbert, Leusdon Vicarage, Ashburton.
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 1867 White, Richard, Instow, Barnstaple.
 1875 White-Thomson, Col., Broomford Manor, Eabourne, North Devon.
 1871 Whiteway, J. H., Brookfield, Teignmouth.
 1870 Whitley, N., Penarth, Truro.
 1872 Wilcocks, H., Spurbarne, St. Leonard's, Exeter.
 1872 Wilkinson, R. C., Bradninch House, Exeter.
 1878 Wilks, G. F. A., M.D., Stanbury, Torquay.
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 1876 Willan, L., M.D., The Library, Penzance.

- 1877 Willcocks, Rev. E. J., M.A., 21, Palmyra Square, Warrington, Lancashire [Teignmouth].
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 1878 Wolfe, Rev. Preb., M.A., Arthington, Torquay.
 1872 WORTH, R. N., F.G.S., 4, Seaton Avenue, Plymouth.
 1876 WORTHY, Charles, 3, Grosvenor Place, St. James.
 1870 Wren, A. B., Lenwood, Bideford.
 1876 Wright, W. H. K., 7, Headlands Park, Plymouth.
 1880 Yonge, Rev. Duke, M.A., Puslinch, Yealmpton, S. Devon.

The following Table shows the progress and present state of the Association with respect to the number of Members.

	Honorary.	Corresponding.	Life.	Annual.	Total.
July 24th, 1879 ...	3	2	58	394	457
Since elected .....	...	...	4	94	98
Since deceased	1	2	3
Since withdrawn	38	38
Since erased	6	6
July 28th, 1880.....	3	2	61	442	508

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LIST OF CORRECTIONS REQUIRED IN "TRANSACTIONS OF
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- Page 12, line 7, col. 1, for "July 26th to 28th" read "July 27th to 29th."
 „ 76, „ 23, for "laid" read "lain."
 „ 91, „ 35, for "immature" read "Immature."
 „ 115, „ 39, for "Lyson's Gentlemen's Magazine" read "Lysons' Gentleman's Magazine."
 „ 116, „ 15, for "Edward" read "Edmond."
 „ 128, „ 20, for "fifteen" read "fifteenth."
 „ 186, „ 33, for "entrees" read "entries."
 „ 226, „ 16, for "do we come" read "we may return."
 „ 242, „ 29, for "afford" read "affords."
 „ 321, „ 40, for "with the world" read "with a world."
 „ 387, „ 7, for "the greatest comfort in an inn" read "the warmest welcome at an inn."
 „ 441, „ 4, for "Figure" read "Figured."
 „ 677, last line, col. 1, for "28th" read "29th."
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THE ANNUAL MEETING IN 1881.

THE ANNUAL MEETING AT DAWLISH

WILL COMMENCE

ON TUESDAY, JULY 26TH, 1881.

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